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ABSTRACT

Designed for students in grades 7 and 8, this electricity/electronics curriculum guide contains instructional modules for ten units of instruction (nine-week class): (1) orientation: (2) understanding electricity: (3) safety: (4) methods to generate electricity: (5) wiring tools and wire: (6) soldering: (7) magnetism and electromagnetism: (8) circuits, symbols, and component identification: (9) resistors and identification systems: and (10) available sources of the Earth's energy. Each instructional module is divded into two sections. The first section of each module is an instructor's guide providing a lesson plan overview of the unit. This overview includes the title of the unit, time allocation, unit goal, unit objectives, evaluation, instructor references, unit overview, suggested presentation hints/methodology, supplemental activities and demonstrations, and instructional module contents listing. Section 2 of the module contains the packet of materials to be utilized in the classroom. Each packet includes the following parts: unit outline/transparency master, pre-post test, vocabulary enrichment activities, student informational handouts, related quest activities, and answer keys. (LRA)

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INDUSTRIAL EDUCATION

ELECTRICITY / ELECTRONICS

CURRICULUM
GUIDE
PHASE II

INSTRUCTIONAL MODULES
LEVEL I
[9 WEEK]

ED182436

CE 023 743

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EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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STATE OF CALIFORNIA

BUREAU OF INDUSTRIAL EDUCATION
DEPARTMENT OF EDUCATION

INSTRUCTIONAL MODULES

A set of 10 technical units which were specifically designed to support Electricity/Electronics instructors in the planning and presentation of their course materials.

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DEDICATION:

To the youth of California in an effort to improve their technical preparation for the world beyond the classroom.

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TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS. ii

    Project Staff ii

    Special Contributors . . . . ii-iii

    Other Contributors iii

PREFACE iv

    Industrial Education iv

INTRODUCTION. v

    Philosophical Background v

    Project Purpose Phase I. . . . . . . v-vii

    Project Purpose Phase II vii

ORIENTATION viii

    Rationale viii

    Scope . . . . viii-ix

    Support Systems. . . . . ix-x

MODULE LISTING xi

4

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The development of the California State Electricity/Electronics Curriculum Guide Phase II was a result of the valuable contributions of the following people.

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Other Contributors

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PREFACE

Industrial Education, in the public schools of California, is a generic term which applies to all levels of education and training which relate directly to industrial occupations. Industrial Education includes the major subject matter fields of industrial arts, trade and industry, and technical and health careers and services. A comprehensive and reflective Industrial Education curriculum will assist and support students in selecting, preparing, and advancing in occupations or careers which currently exist or which are emerging.

Industrial Education programs are also those educational programs which pertain to the body of related subject matter organized for the development of understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology.

In essence, Industrial Education curriculum is concerned with aiding the individual to respond and react sensitively to technological developments and to cope efficiently and effectively with the consequences in one's personal life.

In order to provide skills for students to meet their employment needs in the future, the educational system must meet its curriculum challenges today. One means of solving this problem was the development of the State Electricity/Electronics Curriculum Guide Phase I, that centered on a competency-based cluster approach to derive curriculum. Phase II provides the necessary Instructional Learning Modules including classroom materials for a realistic curriculum foundation which will assist in developing student competencies for entry level occupations and/or technical specialization. Statewide application of these materials will allow for student mobility because of standardization and it avoids duplication of high cost instruction.

It is sincerely hoped that the educational materials contained in this curriculum project will serve as the foundation for improving instruction in the area of Electricity/Electronics within the school systems of California.

7

INTRODUCTION

Philosophical Background

One of the primary purposes of the public schools in our society is to acquaint the young with the nature of the culture within which they live and operate. The American culture is distinctly technological; therefore, it is the responsibility of our educational system to acquaint our youth with the nature of this technological culture. The tremendous acceleration of industrial technology has had and will continue to have an overwhelming impact on society.

One fundamental concept behind Industrial Education in our educational system is that technical experiences, curriculum, instruction, and guidance assist the student in preparation for economic independence and an appreciation for the dignity of work. Another main thrust is to prepare students for a successful life of work by increasing their options for occupational choice, by eliminating barriers to attaining job skills, and by enhancing learning achievement in all subject areas.

Irrespective of what the future may hold, individuals living in our present day environment will be handicapped unless they are reasonable well informed concerning the vast Electrical/Electronic technological applications in our daily living. Our present civilization is scarcely conceivable without the applications of Electricity/Electronics which have become identified with the industrial growth of our country and our thousands of everyday conveniences. The Electricity/Electronics subject field is an integral part of the Industrial Education curriculum, and this field provides employment for millions of individuals annually.

The total impact of Electricity/Electronics on human life is of such magnitude that it necessitates a comprehensive technical program in our schools to produce informed individuals capable of effective and meaningful functioning in our society.

Project Purpose Phase I

During the Industrial Revolution, Industrial Education focused on primary or single skill development, and this approach was viable in an era that required the mastery of one skill for initial employment. However, present technological developments in the labor market have necessitated that individuals within the labor force have a multiplicity of skills to meet the needs of the nation's trade and technological communities.

In order to facilitate methods for students to meet their employment needs in the future, the educational system must meet its curriculum challenges today. One means of solving this problem is the development of an Electricity/Electronics instructional program that centers on a competency-based cluster approach to derive curriculum. Utilizing this approach, the student will have a realistic curriculum foundation which will provide access to the necessary competencies for entry level occupations and/or technical specialization.

The basic intent of the State Electricity/Electronics Curriculum Guide was to provide educators within Industrial Education a competency-based guide that can be adapted or adopted to any existing or new program without major cost expenditures. Hopefully, the guide will act as a catalyst for educators who desire a revision or restructuring of their Electricity/Electronics curriculum, yet the guide format provides the flexibility for teacher-based modifications related to methodology, instructional resources, textbooks, equipment, laboratory systems, etc. For the educator, the heart of this guide was the curriculum outlines that were an outgrowth of the occupational tasks and/or competencies identified through various occupational needs assessments and tasks analysis inventories.

The following is a brief synopsis of each outline in terms of level of instruction and duration.

1. Curriculum Outline Level I - Grades 7-8
    a. 9 week unit outline
    b. 18 week unit outline
2. Curriculum Outline Level II - Grade 9
    a. 36 week unit outline
3. Curriculum Outline Level III - Grade 10
    a. 36 week unit outline
4. Curriculum Outline Level IV (Specialization Level) - Grades 11-14
    a. 36 week unit outline at each grade level

The contents of the curriculum outlines were generated to increase the efficiency of the Electricity/Electronics programs in the schools of this State, and the competency based structure was established for the students so that their complex and confusing world begins to take on order and their learning tasks are more relevant and readily attained.

Project Purpose Phase II

The State Electricity/Electronics Curriculum Guide was proposed as a comprehensive educational guide designed to eliminate the dichotomy between formal school and the world of work. Basically Phase II allowed the development of Learning Modules for the Guide, in an effort to improve the preparation of California's youth for their future in the world beyond the classroom.

Phase II also addressed itself to the development and use of Instructional Modules within the classroom as a vehicle to implement the Curriculum Outlines presented in Phase I.

Instructional Modules were based on each major unit topic within Levels I, II and III of the State Curriculum Guide for Electricity/Electronics. Approximately sixty Instructional Modules or packets were created for teacher/student use. Each module contains basically the following:

1. Goals and Objectives (unit)
2. Outline
3. Pre-Post Test (keyed)
4. Instructor References
5. Suggested Methodology
6. Demonstrations and Quest Activities
7. Student Handouts--Informational
8. Vocabulary Enrichment List
9. Student Worksheets
10. Related Instructional Activities and Graphical Illustrations

ORIENTATION

Rationale

The Instructional Modules in this level were specifically designed to assist the electronics instructor in the planning, organization, and presentation of course materials. Care and emphasis throughout the modules has been given to the needs of technical instructors who must motivate and guide California's youth through the educational system. At the same time the authors of the Instructional Modules were fully cognizant of the need to present fundamental competencies, yet, not in the traditional dry fashion but with an eye towards:

Marketing the Subject Matter
Innovative Assignments
Eye Appeal
Constant Reinforcement
Educational Games
Doing Activities
Immediate Unit Evaluation
"State of the Art" Subject Matter
Diversity in Teaching Methodology

Scope

The Instructional Modules are generally divided into two sections, as follows:

Section I (Instructor's Guide)

This section is presented first in the module to enable the instructor to have a lesson plan overview to the unit. This overview includes;

1. Title of Unit
2. Time Allocation
3. Unit Goal
4. Unit Objectives
5. Evaluation
6. Instructor References
7. Overview (unit)
8. Suggested Presentation Hints/Methodology
9. Supplemental Activities and Demonstrations
10. Instructional Module Contents Listing

All of the suggestions in this section were designed to enhance the unit presentation and provide the most effective learning environment for utilization of all instructional materials. The contents of each module have been carefully prepared and scrutinized in order to establish a solid technical foundation for the student.

Section II (Instructional Module Materials)

This section contains the packet of materials to be utilized in the classroom. When appropriate each module includes;

1. Unit Outline/Transparency Master
2. Pre-Post Test (keyed)
3. Vocabulary Enrichment Activities
4. Student Informational Handouts
5. Related Quest Activities
6. Answer Keys

The Instructional Modules have been constructed and packaged so that the deletion of certain materials or the addition of pertinent information can be inserted or removed with minimal difficulty. Individual courses and instructors are not identical hence provision for flexibility is necessary in order to achieve a curriculum that is compatible with the instructor.

In the event a training program requires a radical change in the content of material presented within a module, the instructor may easily cut, insert, and paste masters to achieve the desired results which are tailored to the instructors specific needs.

Support Systems

No amount of planning or preparation can guarantee success in the classroom, because learning is such an intangible quality, yet, the lack of these ingredients in any program immediately guarantees dismal educational results. The most indispensable support system within the educational process is the teacher, who must have the expertise and enthusiasm that can propel students into the world of learning.

The instructor must also possess the drive and ambition to continuously improve and update the program, especially in this area, due to dramatic technological innovations.

The classroom should contain the necessary furniture to allow the course to be taught in a satisfactory manner. Good lighting is absolutely essential in terms of the activities that occur. Power outlets are of paramount concern for obvious reasons, and their location should allow for room flexibility. Tables, benches, and/or desks should contain locks to insure inventory control, and storage facilities for projects, equipment, parts, etc., must be readily available. Chalkboards and bulletin boards should be mounted for easy access within the classroom.

The field of Electricity/Electronics seems to be a natural interest area to many students and the laboratory portion can be used as the vehicle to generate a vast amount of enthusiasm along with necessary technical concepts. Whether an instructor utilizes individual experiments, project construction, training systems, or a combination approach in their laboratory is not critical; what is vital is that their selection reflects the goals and objectives that they want to attain within the course.

An individual school may have the best physical facility, equipment, instructional materials, and administration, but in the final analysis it is the teacher who must promote, coordinate and maintain the program.

MODULE LISTING

Curriculum Guide Phase II

Level I Instructional Modules* (9 weeks)

Unit 0 Orientation

Unit I Understanding Electricity

Unit II Safety

Unit III Methods to Generate Electricity

Unit IV Wiring Tools and Wire

Unit V Soldering

Unit VI Magnetism and Electromagnetism

Unit VII Circuits, Symbols, and Component Identification

Unit VIII Resistors and Identification Systems

Unit IX Available Sources of the Earth's Energy

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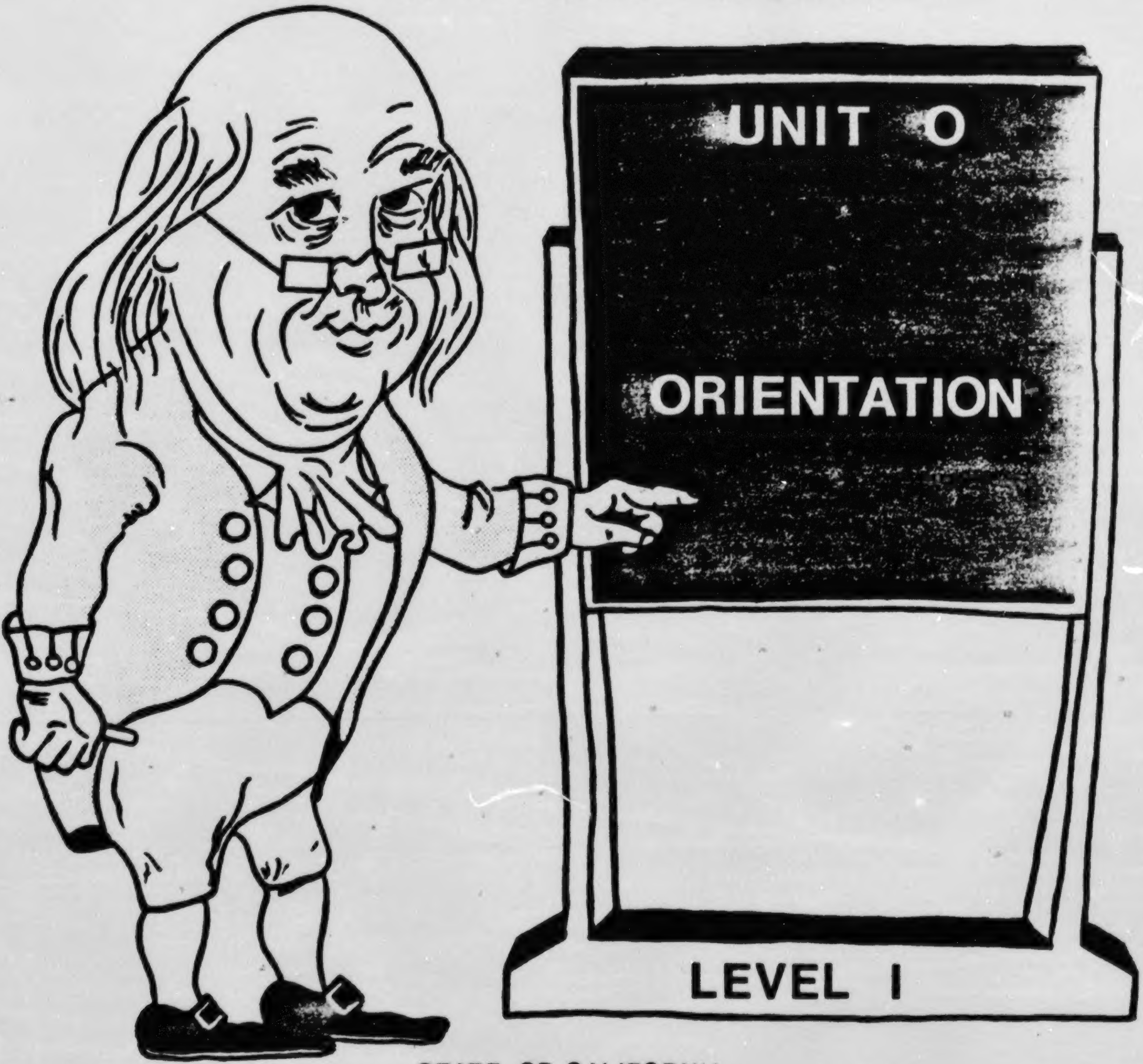
*Instructional Module contents are coordinated with the California Industrial Education Electricity/Electronics Curriculum Guide, Level I, Curriculum Outlines.

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT 0
ORIENTATION
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME______________________
DATE STARTED____________
DATE COMPLETED_________

BY
R. E. LILLO
N. S. SOFFIOTTO

Title of Unit: Orientation

Time Allocation: Several Days

Unit Goal:

To communicate those competencies which will allow an awareness of course goals, objectives, and basic requirements.

Unit Objectives:

The student will be able to:

1. describe examples of the technical nature of our modern society and the need for technical instruction in the area of Electricity/Electronics.
2. explain basic course requirements and the system of student evaluation.
3. demonstrate an awareness of the general course objectives and verify the significance of each within this educational program.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral, or written testing procedures.

Instructor References:

Industrial Education Electricity/Electronics Curriculum Guide Grade Levels 7-14. Published by the State of California, 1977.

Innovative Programs In Industrial Education. Leslie H. Cochran, McKnight and McKnight Co., 1970. Chapters 5, 6, and 7.

Planning and Organizing Instruction. Ralph C. Bohn and Harold Silvius, McKnight and McKnight Co., 1976.

Overview:

This unit should be introduced by examining the course goals and objectives, not merely an instructor/student exercise in reading, but a brief discussion in reference to each item while also highlighting their overall significance.

Basic school or classroom rules and regulations, or operating procedures require attention early and this may be a good opportunity to present those to the class.

The next topic should emphasize specific course requirements and the method for student evaluation. Time should be allocated in such a manner that it will allow extensive descriptions as needed.

This unit will not conclude with an examination as will other modules, because of the length and nature of the subject matter presented.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. This unit can afford the instructor an unusual opportunity to learn about important qualities the student possesses. The Student Questionnaire for example can act as a means to discover a wealth of information, so read through it carefully upon completion, then file all student forms by periods in one notebook for a handy reference.
2. The handout labeled "Student Performance Record" can serve several functions as desired. First, it can be placed at the front of the students' notebook as a title page, or it can be graded periodically to indicate unit performance as evaluated by instructor. Finally, this handout could be a quick Table of Contents for students in terms of specific course content and/or subject matter chronology.
3. When introducing the Informational Handout - Electricity/Electronics, (area description) have each student read out loud a small portion. This will immediately draw your attention to those students who might need special attention.
4. Remember detailed Rules for Conduct and Procedure are located in the safety unit and will be taught at a later time. This unit is only concerned with basic classroom conduct and procedures.

Supplemental Activities and Demonstrations:

1. Initial room impressions are important so if possible have the bulletin boards adequately displayed, materials stored properly, safety signs posted, etc. These kinds of things such as shop appearance develop student attitudes that will affect their own craftmanship or performance.
2. During the first week of school many students can be disenchanted with the "paper shuffling" so try to demonstrate a technical device that can catch their imagination. If a strobe light, color organ, or even a microcomputer is available use it to generate enthusiasm about the program.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Informational Handout (Course Goals and Objectives)
3. Informational Handout (Electricity/Electronics Area Description)
4. Informational Handout (Student Questionnaire)
5. Informational Handout (Student Performance Record)
6. Informational Handout (Student Evaluation System)
7. Exam Answer Sheet (Master)

O. Orientation

A. Course Objectives and Goals

B. Rules of Conduct and Procedures

C. Course Requirements

Name: ____________

Date: ____________

Period: ____________

INFORMATIONAL HANDOUT

COURSE GOALS AND OBJECTIVES

This Electricity/Electronics program is a technical school program designed to make sure that all individuals are prepared with "entry" level skills to enter either the world of work or to continue their education.

Listed below are some general objectives that will be accomplished with the successful conclusion of this course!

An appreciation of the influence the Electricity/Electronics area has on our life.

The ability to select, care for, and utilize electronic products equipment and tools.

An awareness of safe habits and attitudes regarding materials, tools, and equipment.

Opportunities to explore leisure-time activities within this subject field.

An appreciation of design, construction techniques, and craftmanship.

An understanding of the occupational families in the Electricity/Electronics area.

The ability to problem-solve by utilizing sound judgements based on knowledge and experience.

An awareness in regards to energy conservation and its significance.

An understanding of consumer products and their technical operation and application.

Demonstrations of basic technical skills that apply to a range of jobs in Electricity/Electronics.

The recognition of specific training essential for employment in a job area and the basic formation of occupational goals.

Name: ____________________

Date: ____________________

Period: ____________________

INFORMATIONAL HANDOUT

ELECTRICITY/ELECTRONICS

Our grandparents would never recognize the world in which we live or many of the gadgets which are so common to us. Hundreds of electronic wonders which we readily accept in our society were unknown sixty years ago, and have become familiar objects only through the development of a new industry that is called electronics. This industry is now one of the largest in the United States, and a major portion of its research and production plants are located in California.

This school has recognized that present technology and consumer demands offer a special opportunity for students who want occupations which are interesting and challenging and where the chance for advancement and salary are unlimited. The electronics field is one in which continuous research is always adding new products to be made, tested, marketed, and operated. There will be a steady increase in the number of persons employed in this industry according to statistics developed by the State of California.

The student in Electricity/Electronics studies basic electrical theory, laboratory techniques, use of test instruments, care and use of hand tools, shop safety, circuits,and construction or project building. The skills which one can develop may be applied to the areas of communication, transportation computers, research and development, etc.. If the student is deeply interested in his/her work, has abilities, and is willing to study and learn, s/he can progress to an entry level occupation or to continue further technical training.

Basically, electronics is a field that is a combination of the study of mathematics and physical science, and its principles can be understood by the individual who is willing to . . . . .WORK!

Name: ____________________

Date: ____________________

Period: ____________________

INFORMATIONAL HANDOUT

STUDENT QUESTIONNAIRE

PLEASE PRINT

1. Name ______________________________ Phone ____________
   Last First Middle
2. Address ______________________ Grade in School ____________
3. Age _____ Birthdate ______________________
   Month Day Year
4. Father or Guardian's name ______________________________
   Last First Middle
5. Occupation ______________________________
6. Mother or Guardian's name ______________________________
   Last First Middle
7. Occupation ______________________________
8. What are your hobbies? ______________________________
   ____
9. Do you have a job? _____ What? ______________________
10. What occupation would you like to follow? ____________
11. What type of education do you think is required for this occupation?
    ____
12. Previous shop courses

Previous shop courses	School	Grade level	Letter Grade
A. General Shop			
B. Drafting			
C. Woodwork			
D. Auto Shop			
E. Metal Shop			
F. Electricity			

13. List machines you have used in school or at home ____________
    ____
    ____
    ____

Name: ____________________

4. List hand tools you have used in school or at home ____________________

____

____

____

15. Why are you enrolled in this class? ____________________

____

16. Whom to contact in case of an accident ____________________

Address ______________________________ Phone ____________

17. School Activities (athletic teams, clubs, etc.) ____________________

____

18. School Attended last year ____________________

19. List classes taken last year and letter grade for last semester.

	Class	Teacher	Grade
1.			
2.			
3.			
4.			
5.			
6.			

20. Class schedule this year.

Period	Class	Teacher	Room
1.			
2.			
3.			
4.			
5.			
6.			

21. Counselor ____________________

22. Write a brief autobiography, include where you were born, schools attended, interest, goals etc..

SCORE:
GRADE:

Name: ____________
Date: ____________
Period: ____________

ELECTRICITY / ELECTRONICS

STUDENT PERFORMANCE RECORD

Name of Student ________________________________
Last First Middle

UNIT		Unsatisfactory	Satisfactory	Excellent
O. Orientation	O.			
I. Understanding Electricity	I.			
II. Safety	II.			
III. Methods to Generate Electricity	III.			
IV. Wiring Tools and Wire	IV.			
V. Soldering	V.			
VI. Magnetism and Electromagnetism	VI.			
VII. Circuit, Symbol, and Component Identification	VII.			
VIII. Resistors and Identification Systems	VIII.			
IX. Available Sources of the Earth's Energy	IX.			

Rating

(Place this sheet in the front of your notebook as a title page).

____________________ School

____________________ Instructor

Name: ______________

Date: ______________

Period: ______________

INFORMATIONAL HANDOUT

STUDENT EVALUATION SYSTEM

Students are graded as follows each quarter:

CITIZENSHIP: _____%

The citizenship grade is determined by attitude, cooperation, work habits, clean-up, oral participation, and attendance.

This grade may be lowered as follows:

1. Unexcused absences.
2. Unexcused tardies.
3. Improper attitude or behavior.
4. Shop rule violations.

LABORATORY AND HOMEWORK: _____%

The laboratory/homework grade is based on the quality and quantity of the work completed at the end of each quarter.

This grade may be lowered as follows:

1. Quantity and quality below ability.
2. Inconsistent work or progress.
3. Required laboratory experiments, projects, or homework not completed.
4. Failure to observe safety regulations.

TESTS: _____%

This grade is determined by averaging quizzes, tests, and final examinations

NOTEBOOK: _____%

Notebooks will be collected and graded periodically. Notes will be neat, clear, and in proper sequence. They will contain all materials and assignments completed by students, and also those handed out by the instructor.

FINAL GRADE: _____%

The final grade is determined by a collection of grades in the following areas:

1. Laboratory and homework.
2. Citizenship/behavior.
3. Tests
4. Notebook

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM ____

	T	F		
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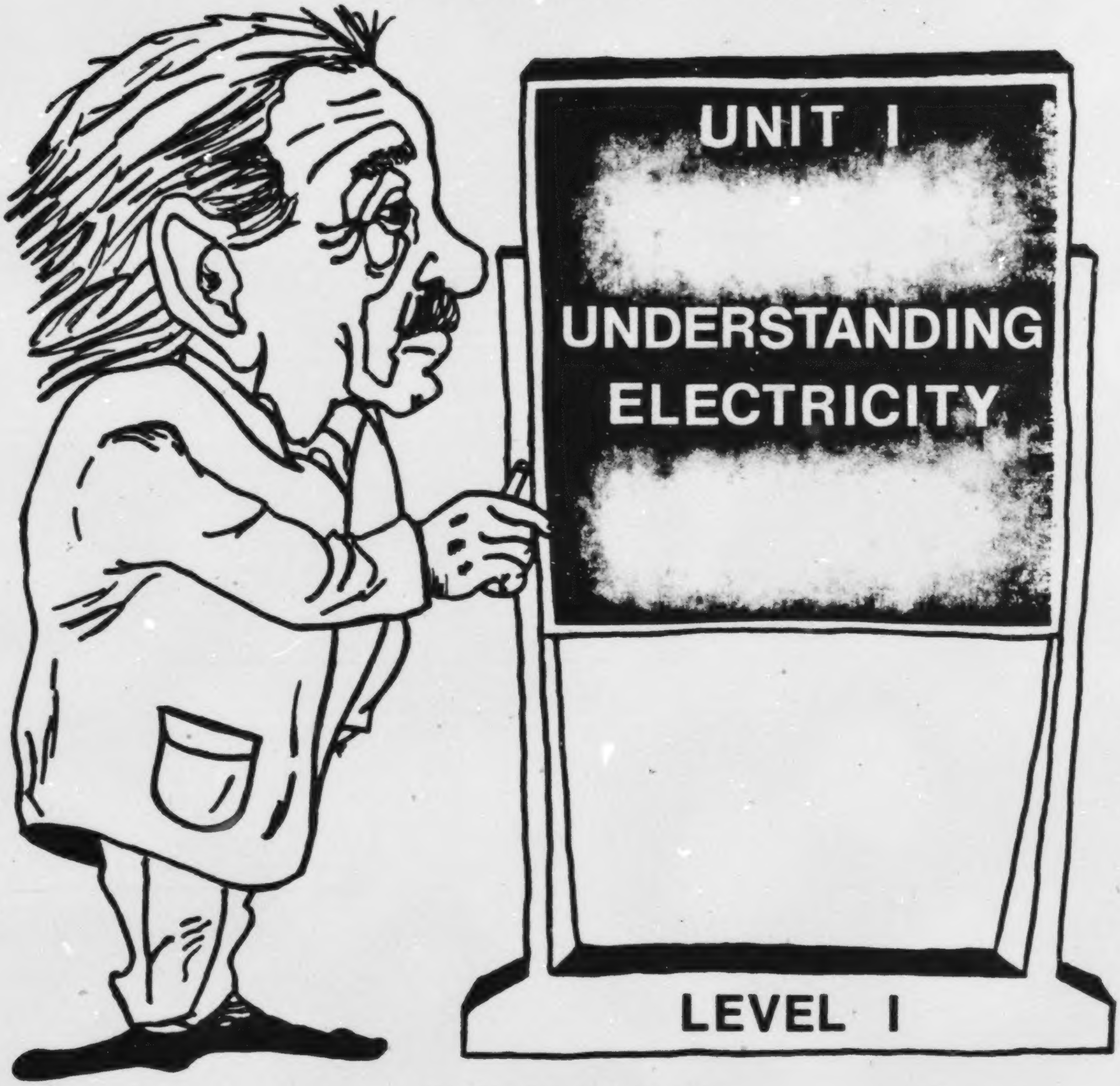
*Show work for problems on back of answer sheet.

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT I
UNDERSTANDING ELECTRICITY
LEVEL I

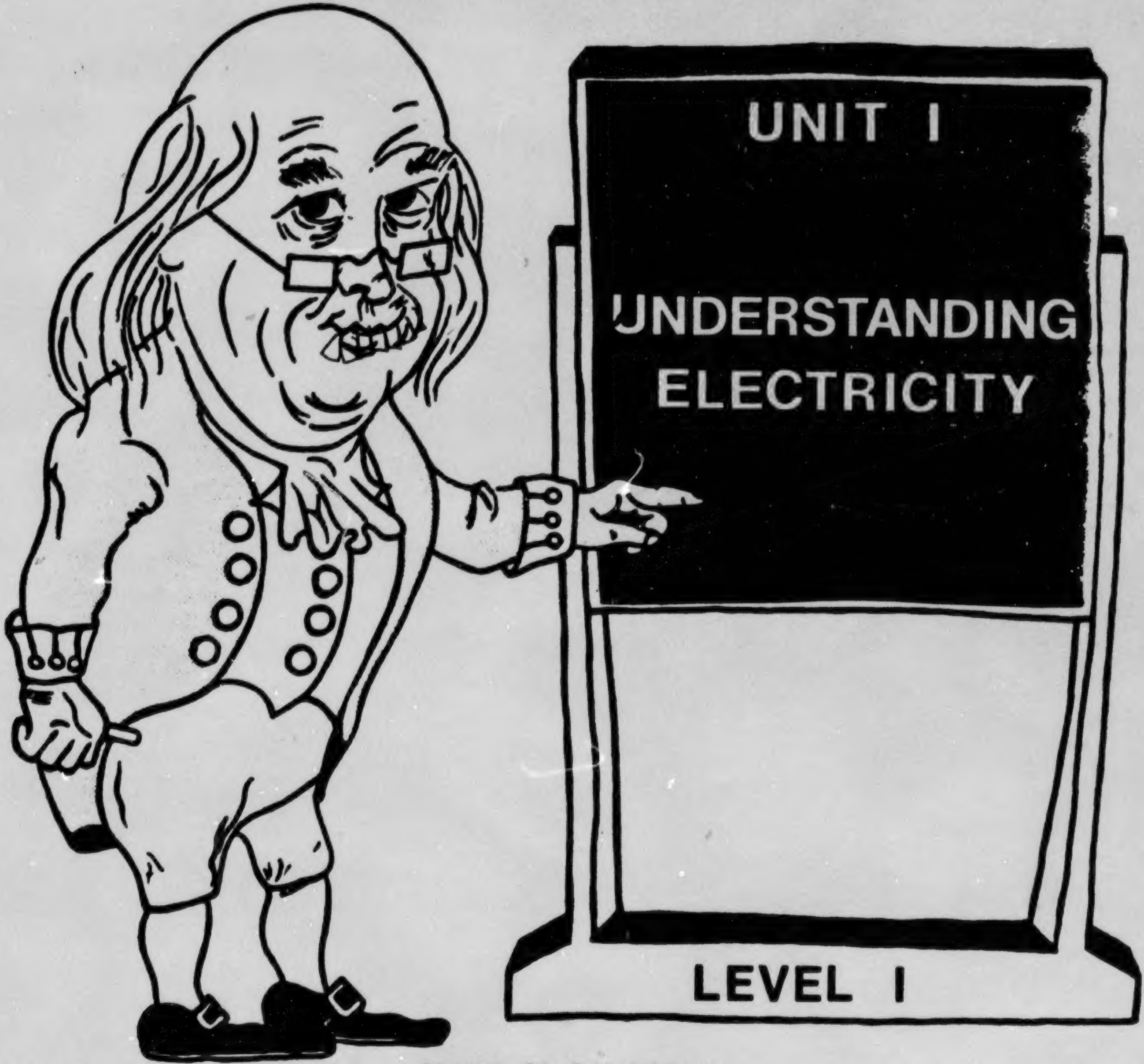
STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME__________________
DATE STARTED___________
DATE COMPLETED________

BY
R. E. LILLO
N. S. SOFFIOTTO

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT I
UNDERSTANDING ELECTRICITY
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME__________________
DATE STARTED__________
DATE COMPLETED_______

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #1

Title of Unit: Understanding Electricity

Time Allocation: Several Days (Units 0 and 1 = 1 week)

Unit Goal:

To communicate and develop those competencies which will permit students to evaluate the basic characteristics of electricity and to comprehend the dramatic role that electricity plays in our technical society.

Unit Objectives:

The student will be able to:

1. describe in general terms, what is electricity and identify several major applications.
2. define the terms static and/or dynamic electricity, and indicate an appropriate example of each type.
3. explain and/or justify the need for mastering fundamental theories related to the Electricity/Electronics field, and verify the importance of this field to modern society.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which utilizes a combination of oral, or written testing procedures.

Instructor References:

Basic Electricity. Marcus and Marcus, Prentice-Hall, Inc., 1974.
Chapters: I and 2.

Basic Electricity Training Manual. Ted Pipe, Howard W. Sams Inc., 1976.
Chapter: I.

Introduction to Electricity and Electronics. Loper and Ahr, Delmar 1973.
Chapter: I.

Overview:

The primary purpose of this unit is to provide an introduction or initial exposure into the Electricity/Electronics area of instruction. The central theme, however, is to provoke student awareness of the nature, characteristics, magnitude, and application of electricity.

The unit lesson should concentrate on first describing that electricity is still in many ways a mystery, although, society has put it to a variety of uses.

Next, a technical presentation explaining the specific principles of both static and dynamic electricity.

Unit 1 should conclude with a review of the importance of electricity and the reasons for its expanding influence and vast market of job opportunities.

This unit will not contain a formal examination as will other modules, because of the length and nature of the subject matter presented.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. An important aspect of this lesson would be to stress that static electricity is largely a nuisance, a disturber, and a potentially dangerous foe in some instances. A frank discussion about lightning, its cause, and how one can avoid harm should be helpful to the student in terms of personal safety.
2. Some students are hesitant to admit that they are confused or that a concept is not clear to them. The student should be aware that in this class there is no penalty for admitting that they are technically bewildered and in need of further explanation.
3. When explaining the basic difference between static and dynamic electricity try to equate static to electrical charges "at rest" while describing dynamic electricity in relationship to electrical charges in motion to accomplish a specific purpose.
4. It is highly important as they begin their studies in this field that they realize that technical reading requires a slower pace due to the illustrations, schematics, and other graphics that must be digested. Recommend to students that when they read, they concentrate on comprehension rather than reading speed.

Supplemental Activities and Demonstrations:

1. This is a sure fire attention grabber if materials are available. Obtain a static machine or Tesla coil and operate it in a manner to dramatically show the affects of static electricity. Check with the science area at your school for possible support materials.
2. Suspend a charged balloon from a stand, then bring a rubber rod that has been rubbed with cat's fur or flannel near the balloon. Observe the reaction and discuss with your class. Repeat this demonstration utilizing a glass rod rubbed with silk!!
3. With the class, itemize all the uses of electricity that they can think of and then list them on the chalkboard. From this list discuss the significance of this subject field to their daily life and the world around them.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Technical Glossary
3. Worksheet - (vocabulary) Word Search
4. Quest Activities
5. Unit Module Answer Keys

I. Understanding Electricity

- A. Why Study Electricity
  - 1. Importance
  - 2. Applications
  - 3. Job opportunities
- B. What is Electricity
  - 1. Kinds
    - a. Static
    - b. Dynamic
      - 1. Electron flow
      - 2. Direct current
      - 3. Alternating current

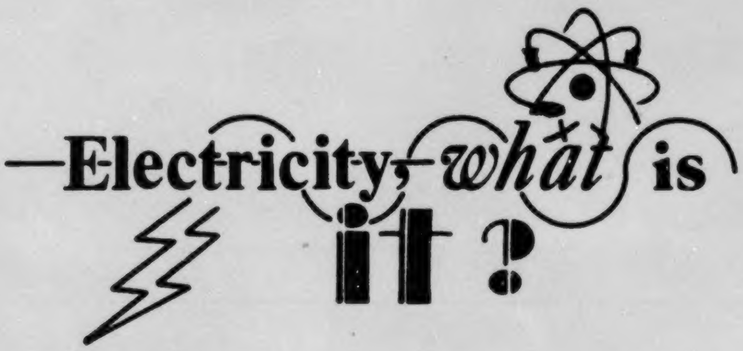
Name: ____________________

Date: ____________________

Period: ____________________

TECHNICAL GLOSSARY

ALTERNATING CURRENT:	A flow of electrons moving first in one direction through a circuit, stopping, then flowing in the opposite direction. Alternating current can be thought of as a back and forth movement of electrons. Abbrev. AC
DIRECT CURRENT:	A flow of electrons moving in one direction through a circuit - from negative to positive. Abbrev. DC
DYNAMIC ELECTRICITY:	A usable, flow or movement of electrical charges. Dynamic electricity provides a continuous flow of electrons which can be used to do work.
ELECTRIC CHARGE:	A collection of positive or negative particles on an object. A material having many negative particles collected on it is said to have a negative charge. While many positive particles provide a positive charge.
ELECTRICITY:	A form of energy, (generated by friction, induction, or chemical reaction) which is based upon the movement of free electrons.
ELECTRON FLOW:	The orderly movement of electrons through a wire, electrical device or circuit.
ELECTRONICS:	The study of electrical action, and especially the study and development of devices and circuits that use and control electricity.
ELEKTRON:	The Greek word for amber (a brownish-yellow fossil resin) which later evolved into the words "electrics" and "electricity".
STATIC ELECTRICITY:	A collection of electrical charges at rest. Static charges are basically an unusable source of electricity, yet can be very dangerous in the form of lightning.


—Electricity,—what is it?

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

VOCABULARY - WORD SEARCH

Locate the electrical terms in the puzzle below, and record your findings in the spaces provided. The first letter of each term is given to you. Circle the words as you find them. Words may be forward, backward, vertical, horizontal, or diagonal but must be in a straight line.

A B C D E F G H I D Y N A M I C J K L A E N O P
Q S U W Z A O C B I E G F H S I R J Q K L P M O
T R T V Y A L T E R N A T I N G C U R R E N T C
U A D C M Z D V E E B J A G E O S E W X C O K N
Y V B B X E A G H C I O W K R U P N Y L T J V E
T A E X Z E L E C T R O N F L O W C Z S R E L G
I R W X W Y H J I C M H E R L S H E I D I E X A
C T B P P G K F K U T A I I O E F H U A C V W T
I C Q T O H B I J R A L N C V V O E V T C H E I
R S N U S B O L N R H D I T E P E S R G H S I V
T R T O I P Q M C E T T V I H G T O O F A A Y E
C M S C T B Q R T N A M A O S H N T O O R O O M
E E D K I A V P S T O P H N A I E R U K G N O J
L F H J V V C W S P W E D T C H U C Y P E L Z Q
E I G L E O N A O P L L H S B A D K C J Z R X T

1. Amber ____________________
2. A ____________________
3. D ____________________
4. D ____________________
5. E ____________________
6. E ____________________
7. E ____________________
8. E ____________________
9. F ____________________
10. N ____________________
11. P ____________________
12. S ____________________

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

QUEST ACTIVITY

"UNIT 1"

FAMOUS PERSON:

My name is Benjamin Franklin and I am a great American. Please complete this fact sheet about my life. (Hint: an encyclopedia would be a good place to start.)

Date Born:

Date Died:

Birth-Place:

Public Servant Jobs:

Inventions and Experiments

Wow, I was great!!!

ANSWER KEY
UNIT 1

A. WORD SEARCH

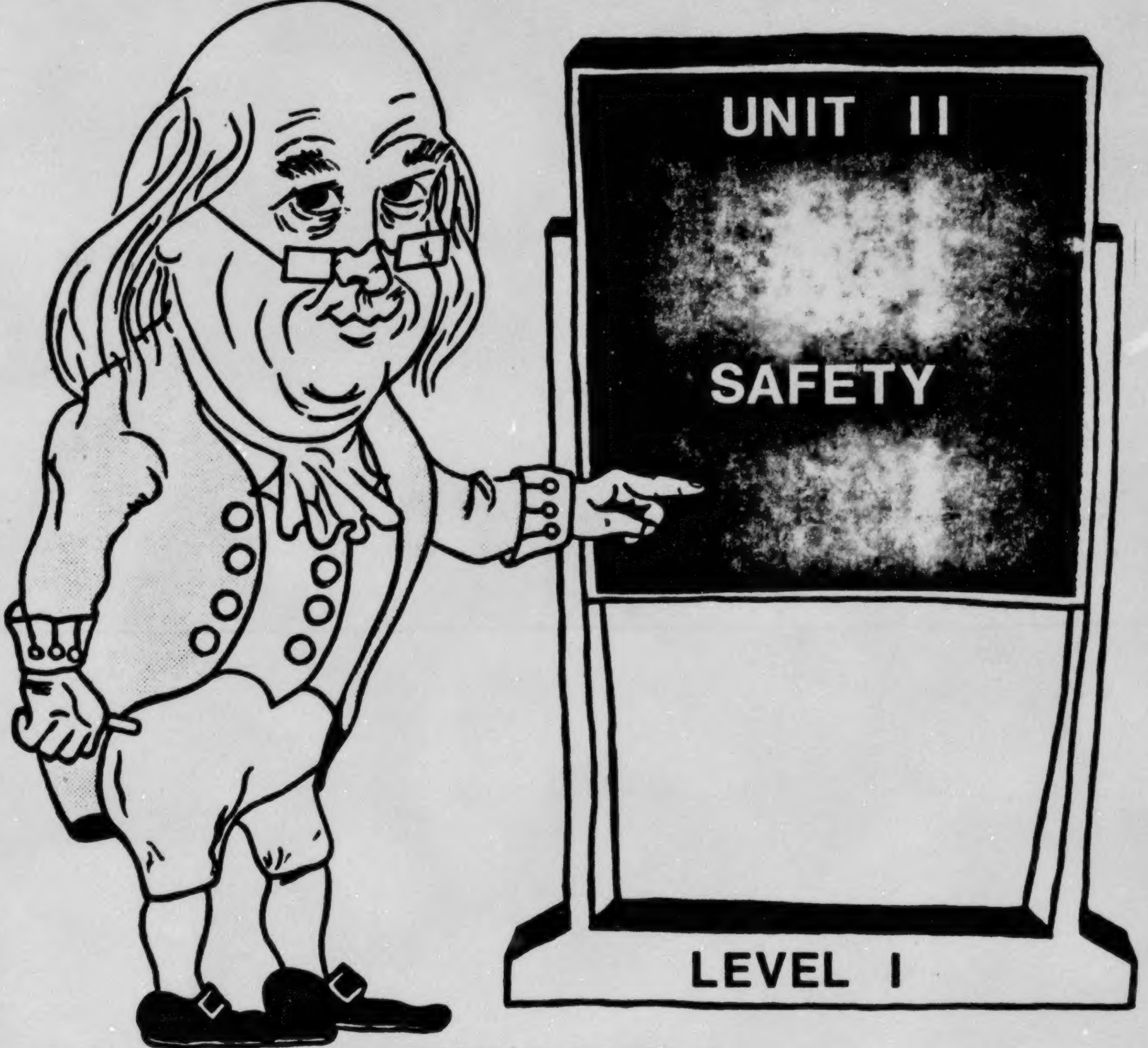
1. amber
2. alternating current
3. dynamic
4. direct current
5. electron flow
6. electricity
7. electronics
8. electric charge
9. friction
10. negative
11. positive
12. static

B. QUEST ACTIVITY

Date born: January 17, 1706
Date died: April 17, 1790
Birth place: Boston Mass.
Public Servant Jobs: Civic leader
Deputy postmaster, Diplomat
Inventions and Experiments:
Invented lightning rods
Invented bifocal lenses
Invented Franklin stove
Experimented with static electricity

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT II
SAFETY
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________
DATE STARTED____________
DATE COMPLETED________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #2

Title of Unit: Safety

Time Allocation: 1 week

Unit Goal:

To inform and instil student competence in safe guarding themselves and to apply this safety attitude to their daily life, whether in the classroom, on the job, or at home.

Unit Objectives:

The student will be able to:

1. identify the three classes or categories of fires, and indicate the proper method of extinguishing each.
2. distinguish between common safe laboratory practices and, hazardous conditions, and pass a safety test with 100% accuracy, based on the information discussed.
3. explain and apply the proper safety and first aid procedures when dealing with an electrical hazard or a serious shock.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria which utilizes a combination of written or oral testing procedures.

Instructor References:

Basic Electricity: Theory and Practice. Milton Kaufman and J.A. Wilson, McGraw-Hill Book Co., 1973. Appendix A.

Industrial Education Safety Guide. Published by the State of California 1978.

Making Safety Work. National Safety Council, McGraw-Hill Book Co., 1976.

Overview:

The unit should be introduced as a necessary, yet meaningful resource for all activities. In order to place "safety" in its proper perspective within the students' mind, stress that safety instruction should begin early in childhood and extend continuously throughout life! The idea that accidents or electrical shock are unaboidable in this kind of class must be discouraged.

The central safety theme of this unit is promoted by the discussion of rules which have been established to assist students in remembering the fundamentals of preventing accidents.

The next topic of emphasis deals with the nature of electrical shock and the first aid procedures to employ if necessary.

This unit concludes with a brief description of fire prevention and fire classifications. The student will also learn about proper extinguishing techniques to be used, dictated by the type of fire encountered.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following.

1. This unit is often used as the most opportune time to introduce both school fire drills or civil defense drills. Try to impress students, during these kinds of activities, with the idea that disaster preparation is the only thing that really saves lives.
2. In the objectives of this unit it is stated that a safety examination must be passed with 100% accuracy, however, with some students this may be virtually impossible. Allow these few the opportunity to retake the test after a study session, but do not advertise this make up test at the beginning of the safety lesson. Sometimes certain disadvantaged students have a very difficult time to comprehend the vast amount of written material handed out, hence they score lower than other students on the test. A buddy study system will assist them greatly in achieving a successful score.
3. When describing dangerous current levels and their affect on the human body, remember that electrical terms and units of measurement may not be familiar to some students at this time, thus much of the impact will be lost if this is not considered and modified.

Supplemental Activities and Demonstrations:

1. Obtain and show a good safety film from regular film sources, local industries, National Safety Council, or any other company and/or institution which offers such a service.

2. When explaining the classification of fires, demonstrate the actual procedures necessary to activate the fire extinguisher. A blast from a chemical extinguisher while explaining operating techniques can stimulate a class instantaneously.

3. Invite a medical guest speaker to deliver a simple first aid presentation to the class. Prior to the class lesson explain to the guest specific areas of concentration that will help the overall safety program.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Word Scramble Puzzle
5. Quest Activities
6. Informational Handout (Shop Conduct and Procedure Rules)
7. Informational Handout (Classification of Fires and Extinguishing Techniques)
8. Informational Handout (Laboratory Safety Procedures)
9. Informational Handout (Electrical Shock
10. Unit Module Answer Keys

II. Safety

A. Safe Use of Hand Tools

B. Safe Use of Power Tools

C. First Aid

D. Fire Safety

E. Safety Test

Test Number ______

LI-U2 SAFETY

UNIT EXAM

ELECTRICAL SAFETY

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. "Horseplay", running, and throwing of objects are dangerous practices in the shop and are forbidden:
(A) when the teacher is looking, (B) only when students are working, (C) at all times, (D) occasionally.

2. When using machines or hand tools:
(A) give the job all your attention, (B) stand up straight, (C) watch your classmates, (D) watch the clock.

3. The floor, aisles, and passageways should be kept clear of stock, tools, and materials. Objects on the floor:
(A) may be left there if the operator of the machine is in a hurry, (B) may cause someone to slip or trip into a moving machine, (C) may be ignored, (D) are unsightly.

4. Students must not talk to or distract a person operating a machine because:
(A) the operator is likely to be injured, (B) conversation slows down the flow of work, (C) the operator is likely to make a mistake, (D) conversation is annoying to the operator.

5. Report to the teacher any:
(A) damaged tools and equipment, (B) missing guards, (C) equipment not working properly, (D) all of the above.

6. Never operate shop equipment when the teacher is:
(A) out of the shop, (B) in the shop, (C) both A and B, (D) none of the above.

7. Most tools are designed for a specific use or purpose. If they are used incorrectly, the result may be:
(A) damage to the student's project, (B) breakage of tools, (C) injury to the students, (D) damage to the bench tops.

8. Long hair is dangerous around shop equipment. If it is long enough to get caught in the machine, it must be:
(A) tied up and back, (B) burned off, (C) pulled out, (D) none of the above.

9. Loose clothing must be securely fastened or removed and long loose sleeves rolled up above the elbows:
(A) before operating any machine, (B) after operating any machine, (C) during the operation of a machine, (C) only when you are assisting the teacher.

10. All accidents and injuries, no matter how slight must be:
(A) ignored, (B) reported to the principal's secretary immediately, (C) reported to your teacher immediately, (D) reported to the shop foreman immediately.

11. Caution other students if you see a violation of shop:
(A) traffic rules, (B) good manners, (C) safety rules, (D) none of the above.

12. Only the operator and __________ are permitted within the working area around a machine.
(A) one other student, (B) the teacher, (C) a helper, (D) all of the above.

13. Gasoline, paints, kerosene, and other materials that will burn or produce fumes should be used:
(A) with another student, (B) in a well ventilated area, (C) at a workbench, (D) in an enclosed area.

14. Students are to operate only those machines or pieces of equipment for which they have received:
(A) instructions to operate, (B) permission to operate, (C) both A and B, (D) none of the above.

15. When touching electrical switches, plugs, or receptacles be sure your hands are dry because:
(A) a switch will not operate properly if your hands are wet, (B) a plug will easily slip from your fingers if your hands are wet, (C) if your hands are wet, you may receive a severe shock and serious burns, (D) none of the above.

16. Acid or chemicals on the hands or face should be immediately washed away with plenty of:
(A) water, (B) glycerine, (C) olive oil, (D) vaseline.

17. If you notice any breakage or damage to tools, instruments, or machinery, you should:
(A) repair the damage yourself, (B) be careful when using such equipment, (C) say nothing because you might get the blame, (D) none of the above.

18. Screws, nuts, and other nondigestible materials are never to be placed in your:
(A) hand, (B) pocket, (C) mouth, (D) all of the above.

19. If you are in doubt about the use of any tool or machine, or about any shop procedures:
(A) ask an advanced student for help, (B) proceed cautiously, (C) always ask your teacher, (D) none of the above.

20. Always sweep scraps from your workbench or table with a brush or whisk broom rather than your hand because:
(A) sharp or jagged particles may injure your hand, (B) less dust is stirred up, (C) this is the easiest way to clean up, (D) it will cause less work for the janitor.

21. Eye protection is used to:
(A) improve your vision, (B) prevent eyestrain, (C) prevent flying particles or corrosive substances from entering your eyes, (D) none of the above.

22. When tools are carried in the hands, keep the cutting edge or sharp points:
(A) directed toward the floor, (B) directed away from the body, (C) directed over the head, (D) directed toward the body to protect others.

23. NEVER direct compressed air:
(A) toward the floor, (B) toward the teacher, (C) toward another student, (D) all of the above.

24. Extension and power cords should always be checked and kept in good repair because:
(A) breaks and tears in the cord are unsightly, (B) breaks and tears in the cord can cause serious shocks or burns, (C) sparks may cause wood to burn, (D) a short may cause the machines to burn up.

25. Carbon dioxide (CO^2) fire extinguishers may be used to put out what types of fires?
(A) electrical fires only, (B) wood fires only, (C) oil fires only, (D) any kind of fire.

26. Water should never be used to put out what kind of fires?
(A) wood fires, (B) electrical and oil fires, (C) paper fires, (D) none of the above.

27. The proper procedure to fight a fire with a fire extinguisher is to:
(A) point the nozzle at the top of the flame, (B) point the nozzle at the middle of the flame, (C) cover the area around the fire and keep it from spreading, (D) point the nozzle at the source of the fire because that is where the fire is located.

28. In case of fire in the shop you should first:
(A) run out of the shop, (B) throw water on it, (C) sound the alarm, (D) none of the above.

29. Lifting any object that is too heavy for you:
(A) is all right if you do it slowly, (B) can be done if you know the right way to lift, (C) should never be done, because it may cause strain or rupture, (D) is a good way to show off your strength.

30. Before the power is turned on, the teacher must check:
(A) the hand tools, (B) the classroom, (C) all special setups, (D) none of the above.

31. The teacher MUST approve:
(A) all "horseplay", (B) all projects, (C) all fighting in the shop, (D) none of the above.

32. Deliberately shorting an electric circuit:
(A) is permissible if the voltage is low, (B) may damage the wires, (C) is an easy method to test whether the circuit is closed or open, (D) may cause an explosion or do bodily harm.

33. Cutting two or more "hot" wires with pliers:
(A) is safe practice if the handles of the pliers are insulated, (B) is permissible if the wires are 18 gage, (C) may be done safely if you are standing on a wooden floor, (D) none of the above.

34. Shop clean up is the responsibility of:
(A) the custodian, (B) all the students, (C) the teacher, (D) the principal.

35. When a machine makes an unusual sound, it should be:
(A) oiled immediately, (B) ignored, (C) reported to the teacher immediately, (D) adjusted.

36. Check a soldering iron for heat with:
(A) your face, (B) your hand, (C) a piece of solder, (D) your feet.

37. To remove excess solder from a soldering iron tip:
(A) wipe with a cloth, (B) flip it off, (C) wash it off, (D) use cleaning fluid.

38. When changing components in an electrical circuit:
(A) leave the plug in, (B) pull the plug out, (C) turn the circuit on its side, (D) turn off the power switch.

39. Make sure that the hand tools you are going to use are:
(A) sharp, (B) the proper tool for the job, (C) in good condition, (D) all of the above.

40. If a tool becomes defective while you are using it you should:
(A) hide it so that no one will know, (B) report the condition of the tool to the instructor, (C) place it back on the tool panel and not say anything (D) repair the tool yourself.

41. Be sure your hands are as free as possible of __________ before using hand tools.
(A) dirt, (B) grease, (C) oil, (D) all of the above.

42. Repairs are to be made on shop equipment only with:
(A) the power on, (B) the machine running, (C) the teacher's permission, (D) none of the above.

43. Spilled oil or grease is dangerous. Always:
(A) clean it up, (B) leave it, (C) pour water on it, (D) none of the above.

44. The motion involved in striking or cutting must be done in a direction:
(A) towards you, (B) away from you, (C) towards other students, (D) all of the above.

45. A project is still dangerous even after its power switch is turned off because:
(A) it may still be plugged in, (B) some of the components may be hot, (C) the capacitors can store a charge which can shock you, (D) all of the above.

46. Never use a file:
(A) without a handle, (B) as a pry bar, (C) as a hammer, (D) all of the above.

47. Pass tools to classmates:
(A) with handles first, (B) with the points first, (C) by throwing them, (D) none of the above.

48. Before starting a machine, you must:
(A) check all adjustments, (B) make sure all guards work, (C) remove all tools/rags, (D) all of the above.

49. Before leaving a machine, you must make sure:
(A) the guards are off, (B) the power is off, (C) the machine has come to a complete stop, (D) both B and C.

50. I did well on this test.
(A) True, (B) False, (C) OK, (D) I blew it.

SAFETY

Name: ____________

Date: ____________

Period: ____________

TECHNICAL GLOSSARY

ACCIDENT:	An unplanned or unexpected occurance usually resulting in injury. Most common shop accidents can be prevented by observing safety rules, working carefully, and using common sense.
ARTIFICIAL RESPIRATION:	A life saving procedure used to revive a person who has stopped breathing. Artificial respiration may be required as a result of electrical shock, drowning, strangling, etc.
CARDIAC ARREST:	A loss of heartbeat caused by electrical shock, or high blood pressure. Closed cardiac massage is the recommended first aid procedure.
ELECTRIC SHOCK:	The flow of an electric current through the body. Shock can cause such physical effects as muscle twitching or paralysis, burns, interruption of breathing, unconsciousness, ventricular fibrillation, cardiac arrest, or death.
FIRE:	A combustion process characterized by heat, flame, and light. There are three general classes of fire: Class A fires involve wood, paper, rubbish, and fabrics; Class B fires involve oil, grease, gasoline, paints, and solvents; Class C fires involve insulation and other combustible materials in electrical and electronic equipment.
FIRE EXTINGUISHER:	A portable, selfcontained device holding a liquid, or chemical which can be sprayed on a fire to extinguish it.
FIRST AID:	Emergency treatment for injury, accidents, or sudden illness generally administered before regular medical care is available.
FLAMMABLE:	A designation for types of materials which are easily ignited or set on fire. Other designations may be used to identify these materials, such as; combustible or inflammable.
GROUNDING:	A safety precaution which calls for placing the metal housing or case of a device at ground potential to prevent possible operator shock. Most commonly, a third wire is added to the power cord. This wire is connected between the case and earth ground allowing an alternate path for current flow. Thus, if the metal housing of a device becomes electrically "hot", current will flow through the grounding wire to the earth, instead of through the operators body to earth.

Name: ____________

Date: ____________

Period: ____________

HAND TOOLS:	This term refers to a wide variety of tools which require physical manipulation or primarily the use of your arms and hand muscles for their operation and use. Examples of typical hand tools would be; screwdrivers, wrenches, soldering irons, pliers, etc..
HAZARD:	The presence of a dangerous or potentially dangerous situation.
HORSEPLAY:	The undesired, potentially hazardous, activity of clowning or playing in the shop or laboratory.
INJURY:	Physical harm or damage to ones body.
LIVE CIRCUIT:	An electrical circuit which is energized, (power applied switch on) and capable of producing current flow.
MACHINE TOOLS:	Generally, power assisted tools utilized for "heavy" jobs which require work beyond that supplied by hand tools. Examples of machine tools; drill press, grinders, sheet metal shears, box and pan break, etc..
SAFETY GLASSES:	Protective eye glasses with shatter proof lenses and side shields. Safety glasses should be worn at all times when necessary while working in the shop. They provide invaluable protection by preventing foreign materials (pieces of wire, chips, broken glass, chemicals etc.) from entering or coming in contact with the eyes. Goggles and face shields can be utilized to provide additional eye protection while working in extremely hazardous areas.
SAFETY PRECAUTION:	An action taken, followed or observed, to avoid a possible hazard or dangerous situation.
SAFETY RULES:	A specific list of rules designed to identify common accident causing situations and hazards. By observing the safety rules many accidents will be avoided or prevented.
VENTRICULAR FIBRILLATION:	A type of heart failure, caused by electric shock, in which the heart muscle no longer beats in a regular fashion but rather quivers erratically. If this condition is not corrected rapidly, death will result.

SCORE:

GRADE:

Name: ____________

Date: ____________

Period: ____________

WORKSHEET

VOCABULARY - WORD SCRAMBLE PUZZLE

Unscramble the letters below to uncover the electronic terms.

EXAMPLE:

A.	ETSAYF	A.	SAFETY
1.	EFRI	1.	
2.	AAZHDR	2.	
3.	IUYJRN	3.	
4.	CANTIDEC	4.	
5.	LABELMAFM	5.	
6.	SOREHAYLP	6.	
7.	GGRNNDIUO	7.	
8.	FISTR DAI	8.	
9.	ADHN OLTO	9.	
10.	FTSYEA LUSER	10.	
11.	VILE IRCCUIT	11.	
12.	ATYESF SSSLEAG	12.	
13.	MANEIHC STLOO	13.	
14.	TEELCCRI KOSCH	14.	

SCORE:	
GRADE:	

Name: ____________________

Date: ____________________

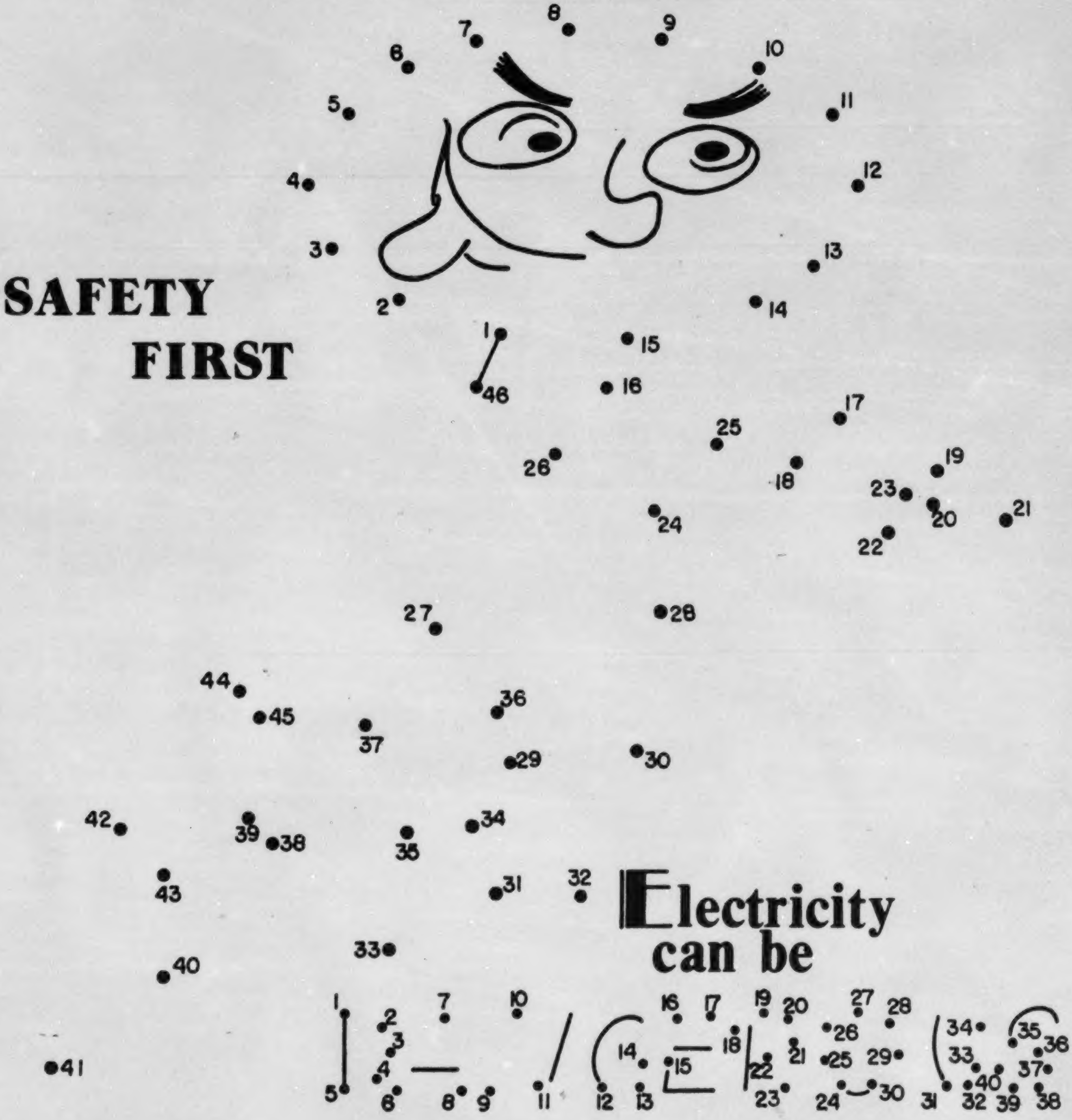
Period: ____________________

WORKSHEET

QUEST ACTIVITY

"UNIT 2"

Connect the dots below to decode the safety poster/message


SAFETY
FIRST
Electricity
can be

SAFETY

Name: ____________________

Date: ____________________

Period: ____________________

INFORMATIONAL HANDOUT

SHOP CONDUCT AND PROCEDURE RULES

1. Students must be on time daily and each student must be in his/her assigned seat before the tardy bell rings.

2. You are required to have a notebook specifically for this subject at your desk each day. It will be collected and graded during the year.

3. You must also supply yourself with the necessary materials for classroom notes - paper and a writing tool.

4. All handouts and notes will be kept neatly in your notebook, not scattered in your locker.

5. Seats (and lab. station) will be assigned. Do not change your seat without consulting your teacher.

6. Absolutely no horseplay in the shop. Many painful accidents occur by the careless and thoughtless antics of the so-called "clown." Walk in the shop at all times. Loud talk and unnecessary noise will not be tolerated.

7. No eating, drinking, or gum chewing is allowed in the shop or classroom.

8. Keep your desk (lab. station) and adjacent floor area clean.

9. Pencils should be sharpened before class. All trash (scratch paper etc.) shall be kept at your desk and thrown away after class only.

10. Throwing anything in the classroom is absolutely forbidden.

11. Turn in all assignments on time. Late assignments will be down graded.

12. If you finish your work before others, use the extra time constructively. Do not disturb your fellow students.

13. Poor attendance will hurt your grade, because it is difficult to make up missed work.

14. It is the students responsibility to make up any tests or missed work.

15. Feel free to ask questions anytime on subject matter which you do not understand.

16. If you must leave the room during class, clear it through the instructor first.

Name: ____________________

Date: ____________________

Period: ____________________

17. Work safely and encourage other students to do the same by setting a good example each day.

18. Use only the machines and tools for which you have satisfactorily passed safety tests.

19. Report any injuries or damage to yourself or equipment to the teacher.

20. Malicious damage to equipment and parts will not be tolerated. You will be required to pay for any damage caused in this manner.

21. Do not remove any project, or material, from the shop without the instructors approval.

22. When the time for clean-up comes, cooperate with the foreman and do your fair share to keep the shop clean and attractive.

23. Students must return to their seats prior to class dismissal at the end of the period. Class will be dismissed only after the shop is clean, all tools are accounted for, and all students are quiet and in their assigned seats.

- -

SHOP CONDUCT AND PROCEDURE RULES

The shop conduct and procedure rules have been read and explained to me. I agree to abide by these rules, and if I have any questions I will ask the instructor.

Students signature: ____________________

Period: ____________________

Date: ____________________

Instructors initial: ____________________

SAFETY

Name: ______________

Date: ______________

Period: ______________

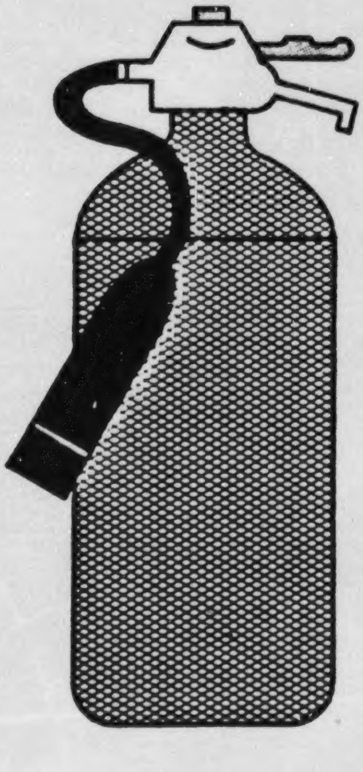
INFORMATIONAL HANDOUT

CLASSIFICATION OF FIRES AND EXTINGUISHING TECHNIQUES

There are three classification categories for fire. Each type of fire requires special extinguishing techniques. Use the chart below to distinguish the extinguishing techniques.

Class "A"

Fires involving combustible material such as wood, paper or cloth: to extinguish, cool and quench with pump type extinguishers containing water, or soda-acid. CO^2 (carbon dioxide) extinguishers may also be used.



Class "B"

Fires involving flammable liquids such as gasoline, kerosene, greases, thinners, and finishes: smother the burning fuel. Foam and CO^2 type extinguishers may be used.

Class "C"

Fires involving electrical equipment; use a nonconducting type extinguisher such as CO^2 or dry powder, and if possible disconnect the source of electrical energy.

NOTE: Always point the fire extinguisher nozzle at the source of the fire and not at the top of the flame.

SAFETY

Name: ______________________

Date: ______________________

Period: ______________________

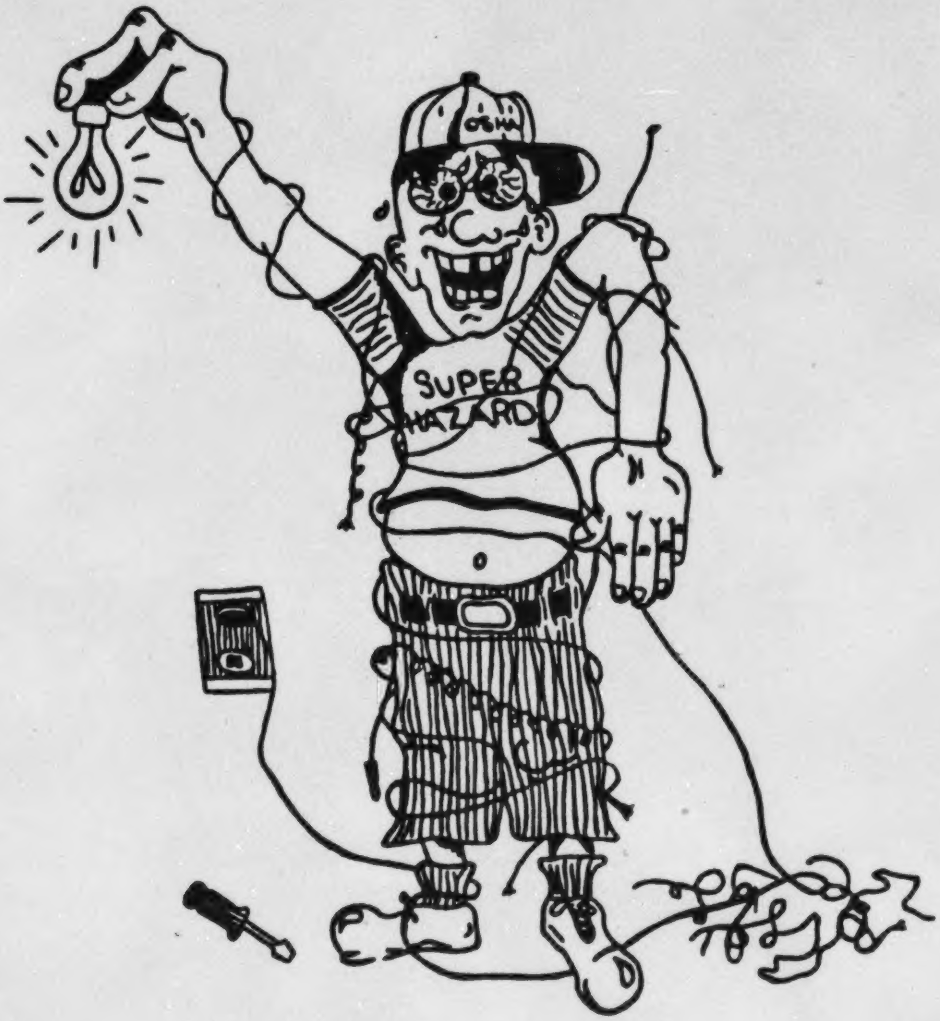
INFORMATIONAL HANDOUT

LABORATORY SAFETY PROCEDURES

INTRODUCTION:

People working in industry know the importance of safe working habits. Safety training programs are sponsored by unions, management, public agencies, and insurance companies. Despite these good efforts, accidents annually cause lost job time, painful injuries, and needless deaths.

Good safety habits are learned daily. As you begin your laboratory work in electricity, resolve now to learn and practice safe working habits in the laboratory. The choice of your future safety and future laboratory work habits is up to you. Form safe habits now.



Name: ______________________

Date: ______________________

Period: ______________________

GENERAL SAFETY PROCEDURES:

Safe Attitudes. Laboratories are working areas for adults. Tricks, games, and horseplay should be left in the school yard.

Safe Environment. Work areas must have proper power, ventilation, and light. Aisles should be open and clear. Storage areas are to be kept clean and secured. The use of temporary extension cords, fans, heaters, gas or water connections is discouraged. Maintain a neat and orderly work area.

First Aid Procedures. Even with good safety practices someone may be injured. Your instructor and/or the school nurse are trained in first aid procedures, but there are several general rules which you should follow.

Don't panic! Determine if there is any immediate danger to the injured person. Never move an unconscious person without cause. Lay such a person flat. Keep the person warm to prevent shock. Never try to force liquids on an unconscious person. If the victim is breathing normally, keep the person still and comfortable until medical aid arrives.

Severe electrical shock or other types of accidents may interrupt breathing. A procedure such as artificial respiration can be used to stimulate the breathing process. Check for a swallowed tongue before application of artificial respiration. This procedure should be administered by a trained person if possible, and continued until medical help arrives. The two common methods of artificial respiration are mouth-to-mouth and the Schaeffer method.

All injuries should be reported to the instructor. Even minor cuts can become infected, and the best first aid supplies, nurses, and doctors cannot help an unreported injury.

Name: ____________

Date: ____________

Period: ____________

GENERAL SAFETY RULES:

Shop Behavior and Safety Practices

1. Clowning, scuffling, pushing, running, and throwing objects are dangerous practices in any shop and are forbidden at all times.
2. Obey all warning signs--they are posted for your protection.
3. Caution any student you see violating a safety rule.
4. When using machines or hand tools, give the job at hand all of your attention.
5. Work at a speed consistent with safety. "Foolish hurry," such as rushing to complete a procedure, is dangerous.
6. Cooperate with your classmates in the shop cleanup program.
7. Machines must not be operated while instructor is out of the room.
8. If equipment is not working properly, shut it off and tell the instructor at once.
9. Report to the teacher all breakage or damage to tools, machinery, or equipment.
10. A student who sees a dangerous situation must report it at once to the teacher.

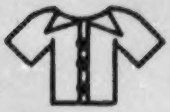
Eye Protection

11. Eye protection must be worn when working in an area where hazardous conditions exist.
12. Face shields or goggles shall be utilized where extra protection is required, such as while grinding or working with caustic substances.
13. Eye glasses must not be used in place of goggles or face shields.
14. When compressed air is used for cleaning, wear eye protection. Take care to direct chips, shavings, and dust away from other students. NEVER ALLOW THE STREAM OF AIR TO COME IN CONTACT WITH YOUR BODY.

Name: ____________________

Date: ____________________

Period: ____________________



Clothing

15. Wear safe clothing when working in a shop. Fasten or remove loose clothing before you operate any machine. Roll long sleeves above the elbows. Apron fastening should be such that they will break if the apron becomes entangled in a machine.

16. Long, loose locks of hair can easily be caught in revolving machinery and ripped out causing serious scalp laceration. Have your hair cut short, tied back, or tightly covered.

17. Wearing gloves is forbidden when you are working with power driven machinery in the lab.

18. Remove jewelry--bracelets, rings, chains, and other accessories that are hazardous in shop work.

19. Sharp, pointed tools or materials are not to be carried in clothing. Hold sharp pointed edges down.

20. Always wear protective clothing when working with chemicals. Rubber gloves should be worn when handling chemicals or immersing your hands in chemical solutions.

21. Always wash hands with soap and water after working with materials that might be harmful to the skin.

Housekeeping

22. Keep your work area clean and orderly. Good housekeeping is part of safety.

23. Keep floors, aisles, and passageways clear of materials and equipment.

24. Keep tools in a safe place. Never leave them where they may cause injury. Put them in tool boxes, trays, cases, or on wall panels.

25. Store material neatly and securely and in a place where persons passing will not be injured.

26. If water, grease or oil is spilled on the floor, clean it up immediately to prevent slipping.

27. Extension cords shall always lie flat on the floor in such a way that students will not trip over them.

28. Always use a brush to clean off benches and machines. There may be sharp or jagged particles among the scraps, which could cause serious injury to the hands.

Name: ____________________

Date: ____________________

Period: ____________________

29. Always keep bench, cabinet drawers, and locker doors closed.

30. Keep tools and materials from projecting over the edge of benches or tables whenever possible.

OK Approval

31. Students are warned not to use machines until they have been given the proper safety instruction, and received permission from the teacher. The student must ask for further instructions if in doubt concerning any operation.

32. When in doubt, ask the instructor. Do not depend upon the advice of another student.

33. The shop safety test must be passed by students in order to operate any power driven machine.

34. Do not operate switches of machines and instruments unless given permission to use them by the instructor.

35. Ask your instructor to approve all projects you plan to do.

36. Repairs are to be made on shop equipment only when permission has been given. Do not tamper with shop equipment.

37. All special set-ups in the lab. must be approved before the power is turned on.

✚ Injury

38. Report all accidents, however slight, to the instructor at once. Infection may result from uncared for cuts and scratches.

39. When lifting heavy objects, keep your arms and back as straight as possible, bend your knees, then lift with the powerful muscles in your legs.

40. Do not attempt to lift heavy items alone. If there is any doubt in your mind about your ability to safely lift an object, ask for help.

41. Screws, nuts, and other nondigestible materials are never to be placed in one's mouth.

Name: ____________________

Date: ____________________

Period: ____________________

Fire

42. The location of fire extinguishers, fire exits, and fire drill procedures shall be known by all students.

43. Nothing shall be hung on fire extinguishers. The area around them must be kept clear so that they may be reached without delay if a fire were to occur.

44. When pouring flammable liquids, be careful not to spill them.

45. Oily or paint-filled rags must be placed in a covered metal container.

46. Toxic chemicals, kerosene, paints, thinners, and other finishes or cleaning materials are to be used in a well ventilated room. They are never to be used near an open flame.

47. Never use water to put out an electrical or oil fire, it will cause the fire to spread.

48. In case of fire in the shop: Sound the alarm; FIRE!!, turn off all gas and electricity, put the fire out.

Hand Tools

49. Be sure your hands are as free as possible of dirt, grease, and oil when using tools.

50. Select the right tool for the job to be done. Use the proper type and size hand tool for the job.

51. Make sure when using a sharp-edged tool to point the edge away from yourself and classmates.

52. When carrying tools in the hands, keep the cutting edge or point directed toward the floor.

53. Clamp small work on a bench or in a vise when using a hacksaw, a screwdriver, or when performing delicate operations.

54. Never use a chisel, punch, or hammer with a "mushroomed" head. Chips may fly off and injure someone.

55. Never use a file without a handle. Be sure that the handle is properly secured to the file.

56. Pass tools to classmates with the handles first.

Name: ____________________

Date: ____________________

Period: ____________________

72. Keep rags away from machines that are in operation.

73. Make sure everyone is clear of the machine before starting it.

74. Have the instructor check all special set-ups and new operations before turning on the machine.

75. Think about your job while operating a machine. It is dangerous to talk when you are using power equipment.

76. Have machine at a dead stop, power off, before cleaning, oiling or repairing. Always turn the power off before leaving a machine.

77. Use only electric power tools that are grounded, or that have UL approved housings.

Safety Zones

78. Only the operator and teacher are permitted within the defined working area around any machine.

79. Do not lean on machines - stand clear.

80. Disturbing another student while he is working is a dangerous practice.

Electrical

81. Consider every electric circuit live until proved otherwise.

82. Make certain your hands are completely dry before touching electrical switches, plugs, or receptacles.

83. Remember even 110 volts can be fatal. Approach all jobs with caution, and analyze each job before you start.

84. The location of emergency power switches shall be known by all students.

85. Never allow anyone to turn power on and off for you while you are working with instruments.

86. Cutting two or more wires at the same time with pliers or other tools is extremely dangerous and may result in damage to the circuit and tools and severe injury to the person if the power is not turned off.

87. Electricity has no respect for ignorance. Do not apply voltage or turn on any device until it has been properly checked by the instructor.

Name: ____________________

Date: ____________________

Period: ____________________

57. Plastic handled screwdrivers should not be used near an open flame or near hot soldering irons.

58. Metal rules should be kept clear of electrical circuits. When in doubt use a plastic or wood rule.

59. All portable electric tools and equipment must be disconnected when not in use.

60. When disconnecting an electric tool or appliance from a circuit, remove the attachment plug from the receptacle by pulling on the plug handle instead of on the cord.

61. There is a right and a safe method to use all tools. Don't try to cut corners by using incorrect methods.

Soldering

62. Never test the heat of a soldering iron by feeling it with your hands. Check the heat of the iron with a piece of solder.

63. Always return the iron to its proper holder.

64. Always wipe off excessive molten solder. Never flip it off. Molten solder inflicts painful burns when it comes in contact with the skin.

65. When passing a soldering iron to another student, place it on the soldering iron rest. The other student can then pick up the iron by the handle.

66. Care must be taken not to let the soldering iron burn any electrical cord, or circuit wire.

Machine Tools

67. Only the operator may start and stop a machine, and after the machine is turned off, s/he should stand by until it has stopped running.

68. All adjustments must be securely fastened before the power is turned on.

69. All wrenches and other tools must be removed from the machine before the power is turned on.

70. Keep machine and safety guards in proper position at all times.

71. Overloading or forcing in any manner any hand operated or power driven machine is dangerous. Use only the material or stock furnished or approved by your teacher.

Name: ____________________

Date: ____________________

Period: ____________________

88. Always stand a safe distance from any project when it is turned on for the first time. Sparks and smoke can be dangerous.

89. Deliberately shorting any electric circuit or generating device may damage the equipment, cause an explosion, or do bodily harm.

90. Certain components such as resistors and vacuum tubes get hot while operating. Wait for them to cool before attempting to remove them.

91. Do not work around electrical equipment if floors are damp or wet.

92. Do not work on an electrical circuit with the power turned on.

93. Be sure equipment is in proper working order before using. Frayed cords and plugs are a major source of accidents.

94. Ask for instructions before using any piece of electronic test equipment. One wrong connection can destroy an instrument and thus deprive you and others of its use until repaired. The repairs can be expensive.

95. Use proper instruments for testing circuits.

96. Before replacing a fuse in any electrical equipment, disconnect the power source.

97. When making temporary or permanent connections, carefully avoid leaving open splices or pieces of wire sticking out. Secure all wires properly. Tape or cover the connections.

- -

LABORATORY SAFETY PROCEDURES

The laboratory safety procedures have been read and explained to me. I agree to abide by these rules, and if I have any questions I will ask the instructor.

Students Signature: ____________________

Period: ____________________

Date: ____________________

Instructors Initial: ____________________

SAFETY

Name: ____________________

Date: ____________________

Period: ____________________

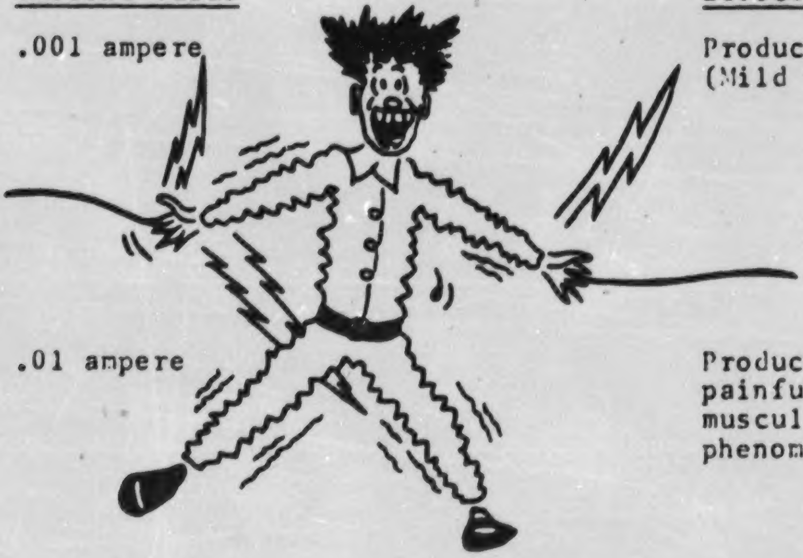
INFORMATIONAL HANDOUT

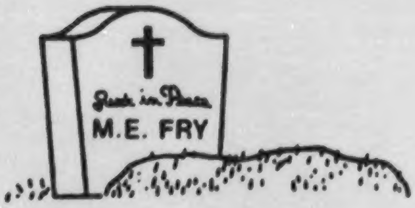
ELECTRICAL SHOCK

One of the major hazards in the electronics field is protection against electrical shock. Shock is caused by the passing of electric current through the body. Current flow is related to the voltage applied and therefore the higher the voltage the more serious the shock. Don't however get the idea that low voltages do not shock for they certainly do if the circumstances are right.

Let's see what can happen when an electric current passes through your body. A number of effects may occur depending upon the circumstances and magnitude of the shock.

Current Value	Effect
.001 ampere	Produces a shock than can be felt. (Mild "tingling" sensation).
.01 ampere	Produces a severe shock, which is painfull, and can cause loss of muscular control. (Can't let go phenomenon).
.1 ampere	Produces a potentially fatal shock which can cause death if current lasts for a second or more.





Name: ____________

Date: ____________

Period: ____________

As you can see, the body is sensitive to relatively small current flows. As a comparison, a common 100 watt light bulb draws a current flow of .85 amperes, far higher than the .1 ampere of current which can cause death.

OTHER EFFECTS OF ELECTRIC SHOCK:

Muscular Paralysis-

Burns-

Cessation of breathing-

Unconsciousness-

Ventricular fibrillation-

Cardiac arrest-

All of these effects do not occur with every shock. As stated before, conditions vary. What happens to you depends upon several factors:

(1) The intensity of the current.
(2) The frequency of the current.
(3) The path the current follows through the body.
(4) How long the current passed through the body?
(5) Did you expect to be shocked?

Keep in mind, that the current flow through your body, not the amount of voltage applied is the determining factor in the severity of a shock you might receive. The higher the current, the more dangerous the shock.

CAUTION: Electric shock can be harzardous to your health.

SCORE:

GRADE:

Name: ______________

Date: ______________

Period: ______________

ANSWER SHEET

EXAM LI-U2

	T	F				T	F				T	F				T	F		
	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1.			■		26.		■			51.					76.				
2.	■				27.				■	52.					77.				
3.		■			28.			■		53.					78.				
4.	■				29.			■		54.					79.				
5.				■	30.			■		55.					80.				
6.	■				31.		■			56.					81.				
7.			■		32.				■	57.					82.				
8.	■				33.				■	58.					83.				
9.	■				34.		■			59.					84.				
10.			■		35.			■		60.					85.				
11.			■		36.			■		61.					86.				
12.		■			37.	■				62.					87.				
13.		■			38.		■			63.					88.				
14.			■		39.				■	64.					89.				
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16.	■				41.				■	66.					91.				
17.				■	42.			■		67.					92.				
18.			■		43.	■				68.					93.				
19.			■		44.		■			69.					94.				
20.	■				45.				■	70.					95.				
21.			■		46.				■	71.					96.				
22.	■				47.	■				72.					97.				
23.				■	48.				■	73.					98.				
24.		■			49.				■	74.					99.				
25.				■	50.					75.					100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 2

A. SCRAMBLED WORD PUZZLE

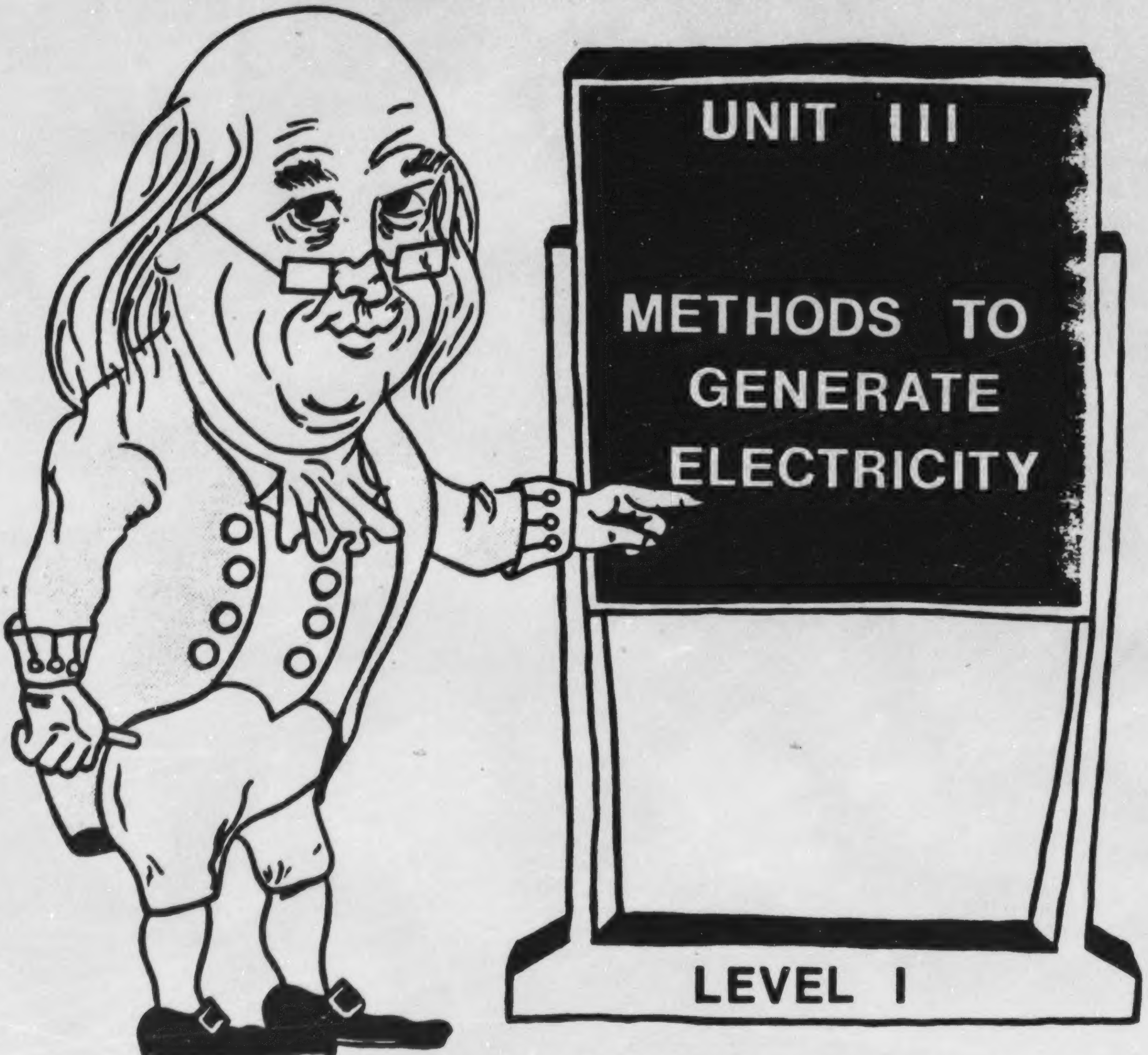
1. fire
2. hazard
3. injury
4. accident
5. flammable
6. horseplay
7. grounding
8. first aid
9. hand tool
10. safety rules
11. live circuit
12. safety glasses
13. machine tools
14. electric shock

B. QUEST ACTIVITY

(subjective evaluation)

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT III
METHODS TO GENERATE ELECTRICITY
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME________________________
DATE STARTED______________
DATE COMPLETED____________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #3

Title of Unit: Methods to Generate Electricity

Time Allocation: 1 week

Unit Goal:

To disclose those competencies which will introduce the student to a variety of sources and/or methods of producing electricity.

Unit Objectives:

The student will be able to:

1. identify six methods of producing electricity.
2. illustrate by example how each of the sources discussed produces electricity.
3. explain in detail the two kinds of cells that are classified under chemical action.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of written, oral, and laboratory testing procedure.

Instructor References:

Basic Electronics Systems Technology Unit 1. Dugger, Patrick, Suess, and Ziegler, Bruce, 1973. Lessons: 2-6.

Electricity and Electronics. Walter B. Ford and William B. Steinberg, American Technical Society, 1974. Units: 6-9.

Electricity One-Seven. Harry Mileaf, Hayden Book Company, Inc., 1976. Chapter: Electricity 1.

Overview:

Unit 3 focuses on the fact that electricity has become an essential part of our life, therefore it is important to be aware of the sources for creating electrical energy.

The instructor should first examine the sources that are available, then identify those which are small-scale sources and those that are classified as large-scale sources in terms of power produced.

This unit introduces the six basic sources of electricity along with some of the details of application. The actual concept of "how" these sources generate electricity will be considered at a higher level of instruction.

A variety of appropriate exercises and laboratory experiments and/or project should be coordinated with all unit topics when feasible.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. Try not to leave the impression that the sources presented in this unit are the only sources; they are just the most common ones. Explain further that many other sources have potential, yet are still in the experimental stage in terms of development.
2. Most of the methods of producing electricity can be explored in greater depth during laboratory activities in which the student physically examines and/or performs a variety of experimentation.
3. When discussing heat, light, or pressure methods of producing electricity, under small-scale production, it is important to emphasize that these methods are primarily utilized in control or sensing types of circuits.
4. Discuss with the class in detail the topic of cells and batteries. Present the primary type cells as being basically non-rechargeable, while the secondary type is rechargeable. Stress that the output pressure (voltage) is greater in the secondary cell.
5. Introduce new career choices to your class which may exist in the future in special energy areas like solar, geothermal, wind power, and nuclear fusion, however, note that Unit 10 of this level will deal with this subject in greater detail.

Supplemental Activities and Demonstrations:

1. Producing electricity through heat action can be demonstrated by using a pair of wires (iron and nichrome) and a large galvanometer. Twist the loose ends of the wires together and heat the junction with a match.
2. Producing electricity through pressure action can be demonstrated with a record player pickup. Apply pressure to the needle and then measure the voltage across the cartridge.
3. Producing electricity through light action can be demonstrated with a measurement of the output of a solar cell. The output will increase as the light striking its face increases.
4. Many vendors sell an inexpensive dry cell kit which is both fun and a real learning activity - try it.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Spelling Puzzle
5. Quest Activities
6. Informational Handout (Six Methods Used to Produce Electricity)
7. Unit Module Answer Keys

III. Methods to Generate Electricity

- A. Friction
- B. Pressure
- C. Heat
- D. Light
- E. Chemical
  - 1. Cells and batteries
    - a. Primary cells
      - 1. Simple "lemon" cell
      - 2. Carbon zinc
      - 3. Other types
    - b. Secondary cells
      - 1. Lead acid cell
      - 2. Other types
- F. Magnetic
  - 1. Electromagnetic induction
  - 2. Simple DC generator
- G. Project Construction

Test Number _____

LI-U3

UNIT EXAM

METHODS TO GENERATE ELECTRICITY

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. Static electricity is produced by heat. (T-F)

2. A charged rod will attract a neutral material. (T-F)

3. Two types of static charges are positive and negative. (T-F)

4. Most primary cells are rechargeable. (T-F)

5. The common "D" size dry cell uses carbon and tin for its metal plates or electrodes. (T-F)

6. A battery can change chemical reactions into electrical energy. (T-F

7. Light shining on a crystal will produce a small amount of electricity (T-F)

8. Moving a coil of wire through a magnetic field will produce electricity. (T-F)

9. A thermocouple is an example of a piezoelectric device. (T-F)

10. A DC generator contains a coil of wire (armature), magnetic field (field winding),- and a commutator. (T-F)

11. A charged rubber rod will attract:
(A) a charged glass rod, (B) a positively charged material, (C) a neutral material, (D) all of the above.

12. The liquid in a wet cell is called the:
(A) acid juice, (B) electrolyte, (C) chemical composition, (D) electrode.

13. Piezoelectricity is electricity produced by:
(A) heat, (B) chemical reactions, (C) pressure, (D) magnetism.

14. A generator requires a coil of wire, motion, and __________ in order to produce electricity.
(A) light, (B) heat, (C) friction, (D) magnetism.

15. Which of the following is an example of a photoelectric device?
(A) solar cell, (B) thermocouple, (C) battery, (D) Rochelle salt crystal.

Name: ____________

Date: ____________

Period: ____________

TECHNICAL GLOSSARY

ACID:	A strong chemical substance with corrosive properties. Vinegar, is an example of a weak acid, other common acids are citric acid and sulfuric acid.
BATTERY:	Two or more cells connected together. A battery is an important source of DC electrical energy because it is self-contained, and portable.
CELL:	A single voltaic unit, which is made by combining two dissimilar metals and an acid solution or electrolyte.
CHEMICAL ELECTRICITY:	A source of DC electricity, which is produced by chemical reactions. A cell and a battery are examples of chemical electrical devices.
COIL:	A number of turns of insulated wire, usually wrapped in circular form. A coil of wire is a necessary part of a generator.
GENERATOR:	A device used to produce electricity, by moving a coil of wire through a magnetic field; or by keeping the coil stationary, and moving the magnetic field.
PHOTOELECTRICITY:	A source of DC electricity, which is produced by light energy. Photoelectrical devices are of three types - photovoltaic, photoconductive, and photoemissive. Photovoltaic devices produce electricity directly from light.
PIEZOELECTRICITY:	A source of electricity which is produced when pressure is applied to a certain crystal material such as quartz, Rochell salts, or barium titanate.
PRIMARY CELL:	A type of voltaic cell, which will produce electricity as soon as the chemicals are combined, and generally cannot be recharged.
SECONDARY CELL:	A cell which requires charging before it will produce electricity, and can be recharged many times.
STATIC ELECTRICITY:	A collection of electrical charges (both positive, and negative) at rest on the surface of an object. Static charges are produced by friction.
THERMOCOUPLE:	A device consisting of two different metals joined at a junction. When the junction is heated, a small amount of DC electricity is produced.

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

VOCABULARY - SPELLING PUZZLE

Copy the correctly spelled word in the box to the right as indicated in the example below.

A. (example) (exhample) (xample) A. example

1. (coyle) (koil) (coil) 1. ☐

2. (cell) (sell) (ceel) 2. ☐

3. (statik) (static) (statick) 3. ☐

4. (primury) (primeary) (primary) 4. ☐

5. (battary) (battery) (batery) 5. ☐

6. (acid) (asid) (asaid) 6. ☐

7. (kemical) (chemikal) (chemical) 7. ☐

8. (generater) (jenerator) (generator) 8. ☐

9. (secondary) (secandary) (secondairy) 9. ☐

10. (alectricity) (electricity) (elektricity) 10. ☐

11. (thermaolcouple) (thermecouple) (thermocouple) 11. ☐

12. (photoelectricity) (fotoelectricity) (photoalectricity) 12. ☐

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

QUEST ACTIVITY

"UNIT 3"

Use your testbook, or other resource to locate the information required in the problems below.

1. Draw an accurate sketch of a zinc-carbon cell. Label the major parts of the cell.

ZINC-CARBON CELL

2. Is the zinc-carbon cell a primary or secondary cell? (Circle one)

3. Draw a sketch of a basic lead-acid battery. Label the major parts of the battery.

LEAD-ACID BATTERY

4. Is the lead-acid battery a primary or secondary battery? (Circle one)

5. What advantage does a secondary cell have over a primary cell?

Name: ____________________

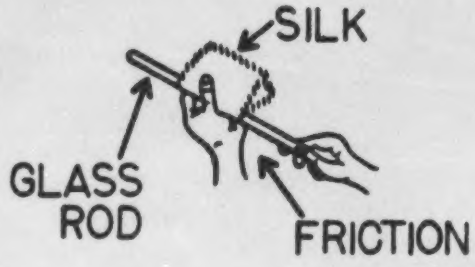
Date: ____________________

Period: ____________________

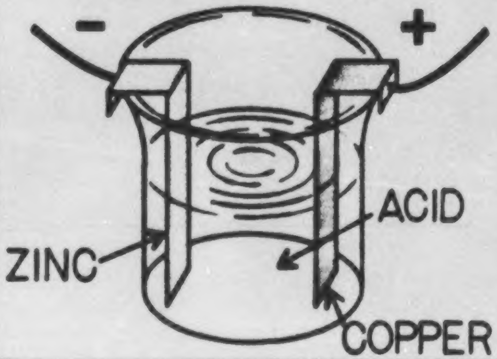
INFORMATIONAL HANDOUT

SIX METHODS USED TO PRODUCE ELECTRICITY

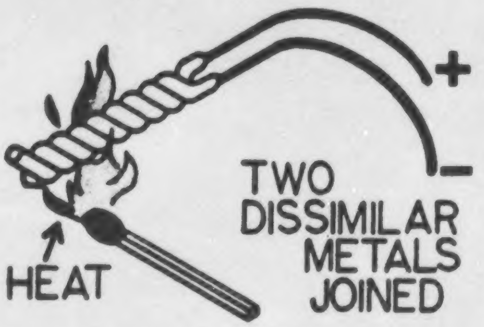
-Electricity from friction-
(static electricity)


SILK
GLASS ROD
FRICTION

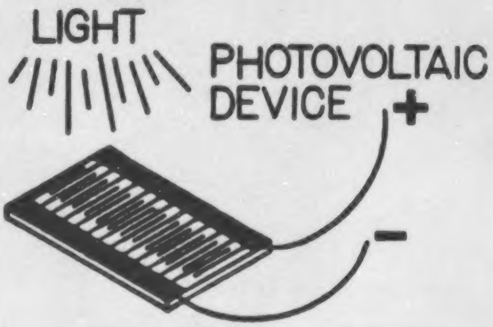
-Electricity from chemicals-
(chemical electricity)


-
+
ACID
ZINC
COPPER

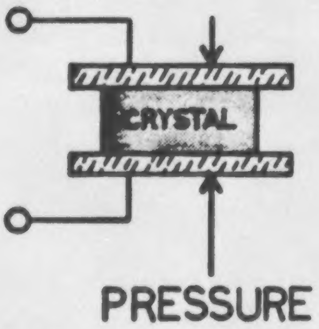
-Electricity from heat-
(thermoelectricity)


+
-
TWO DISSIMILAR METALS JOINED
HEAT

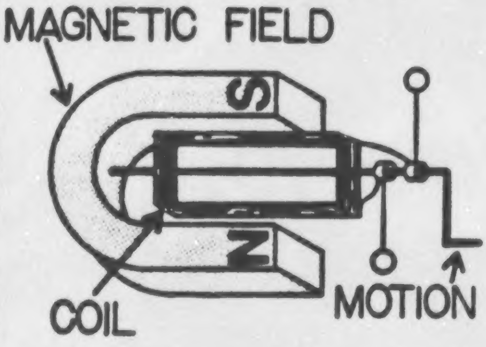
-Electricity from light-
(photoelectricity)


LIGHT
PHOTOVOLTAIC DEVICE
+
-

-Electricity from pressure-
(piezoelectricity)


CRYSTAL
PRESSURE

-Electricity from magnetism-
(magnetoelectricity)


MAGNETIC FIELD
S
N
COIL
MOTION

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM LI-U3

	T	F				T	F				T	F				T	F		
	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1.		■			26.					51.					76.				
2.	■				27.					52.					77.				
3.	■				28.					53.					78.				
4.		■			29.					54.					79.				
5.		■			30.					55.					80.				
6.	■				31.					56.					81.				
7.		■			32.					57.					82.				
8.	■				33.					58.					83.				
9.		■			34.					59.					84.				
10.	■				35.					60.					85.				
11.				■	36.					61.					86.				
12.		■			37.					62.					87.				
13.			■		38.					63.					88.				
14.				■	39.					64.					89.				
15.	■				40.					65.					90.				
16.					41.					66.					91.				
17.					42.					67.					92.				
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19.					44.					69.					94.				
20.					45.					70.					95.				
21.					46.					71.					96.				
22.					47.					72.					97.				
23.					48.					73.					98.				
24.					49.					74.					99.				
25.					50.					75.					100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 3

A. SPELLING PUZZLE

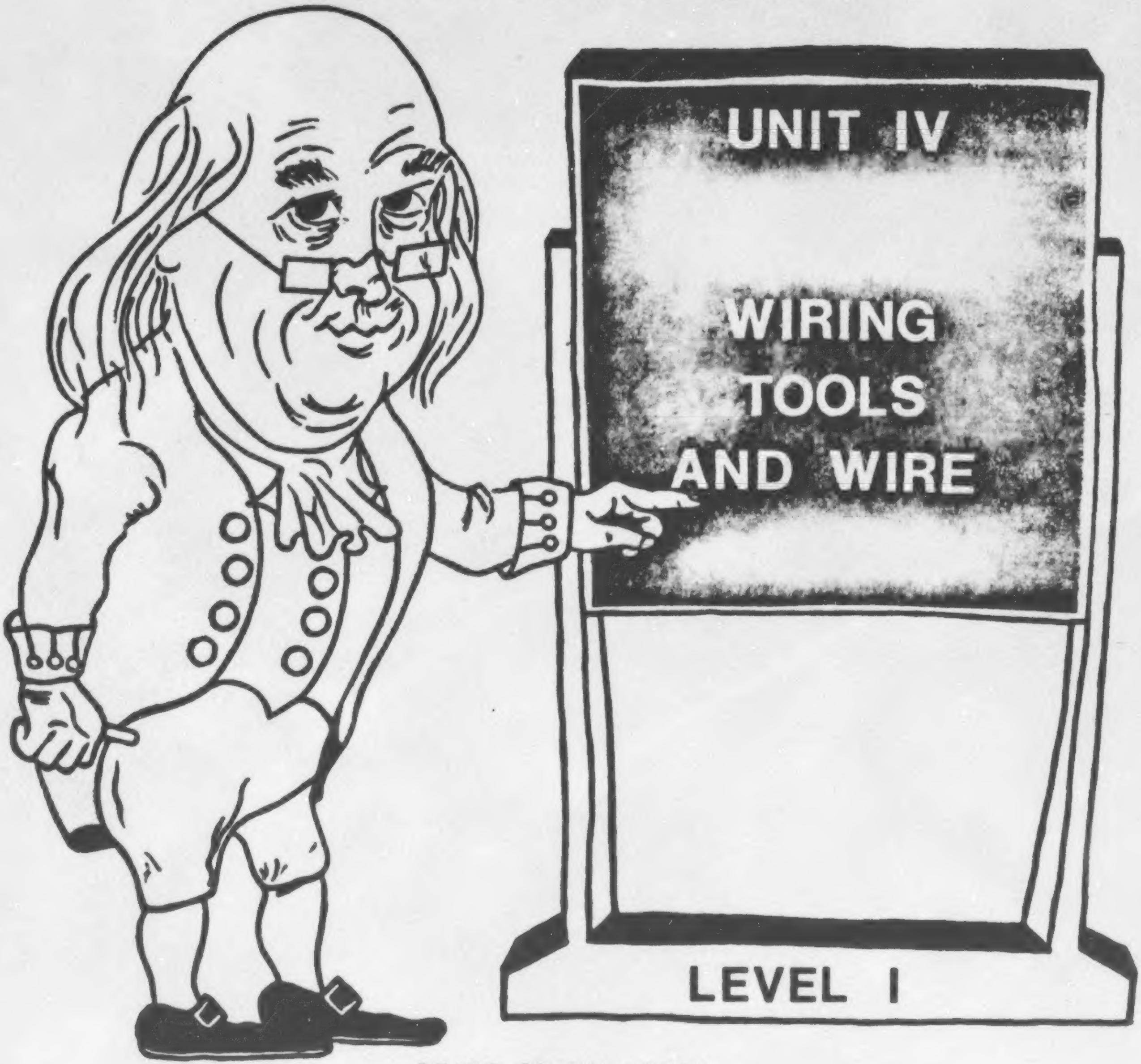
1. coil
2. cell
3. static
4. primary
5. battery
6. acid
7. chemical
8. generator
9. secondary
10. electricity
11. thermocouple
12. photoelectricity

B. QUEST ACTIVITY

1. (subjective evaluation)
2. primary
3. (subjective evaluation)
4. secondary
5. (subjective evaluation)

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT IV
WIRING
TOOLS
AND WIRE
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________

DATE STARTED____________

DATE COMPLETED________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #4

Title of Unit: Wiring Tools and Wiring

Time Allocation: 1 week

Unit Goal:

To establish basic technical assembly and electrical skills by conveying those competencies relevant to successful usage of tools and wiring techniques.

Unit Objectives:

The student will be able to:

1. describe the function, list safety precautions, and illustrate the correct use of each essential wiring tool presented in this unit.
2. demonstrate the proper method of preparing wire for electrical utilization and explain several standard methods to terminate wire.
3. explain the purpose of wire and insulation, and indicate the reasons for the different types of wires.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which utilizes a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electronics Assembly and Fabrication Methods. S.R. Duarte and R.L. Duarte, McGraw-Hill Book Co., 1973. Chapters: 1, 5, 6, 7, 8, 9, and 10.

Electronic Techniques. R.S. Villanucci, A.W. Avtgis, and W.F. Megow, Prentice-Hall, Inc., 1974. Chapters: 3-16.

Technical Electricity and Electronics. Peter Buban and Marshall L. Schmitt, McGraw-Hill Book Co., 1977. Units: 27-31.

Overview:

Unit 4 will allow the student to develop competencies that will act as a foundation for future mechanical and electrical assembly tasks.

The unit should also be introduced as a valuable resource in project construction. The idea of constructing a project should be stressed as a necessary "hands on" experience in order to facilitate working with devices and processes.

The central theme is to describe a variety of tools and basic electrical skills for the students to become familiar with and develop, however, craftmanship is also a quality that must be emphasized by the instructor as an on going process that should permeate all levels of activities.

Most major topics in this unit can be presented through laboratory demonstrations, and projects. A student project can really assist in evaluating student understanding and it will further motivate the students in their studies.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. When illustrating basic hand tools and describing their function, an overhead projection can be easily adapted as a means to show tool outline or shape. In addition, physically tracing tools with color pencils can assist disadvantaged students in learning the basic differences in size, shape, etc.
2. Hopefully, in this unit a variety of simple exercises on wire identification, techniques of wire stripping, methods of wire termination or wire size determination can really help introduce students to many basic assembly techniques.
3. Whatever unit project or lab activities are utilized, it is vital at this age to have activity organization, adequate materials, and good supervision of the class.
4. At this educational level it is also wise when instructing students in tools and wiring techniques to utilize higher ability students to assist in demonstrating a procedure or helping a slower student.

Supplemental Activities and Demonstrations:

1. The vocabulary list presented in this unit is long. Spend a good deal of time describing each term and if possible demonstrate each tool listed and emphasize safety precautions when appropriate.
2. Wire stripping stranded wire is taken for granted by many instructors, however, the correct technique is sometimes difficult for students to acquire. When demonstrating this skill make an effort to explain what happens electrically and mechanically when strands are broken during the stripping process.
3. Remember that safety must be stressed especially in this unit. Try to emphasize to students for example, that when changing an AC plug extreme care must be observed to secure wires in their proper location to avoid a hazardous situation

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Tool and Material Identification
5. Quest Activities
6. Informational Handout (Tools and Equipment I May Need)
7. Informational Handout (Wire: Purpose and Use)
8. Informational Handout (Wire Termination Methods)
9. Unit Module Answer Keys

IV. Wiring Tools and Wire

- A. Essential Wiring Tools and Usage
  1. Long nose pliers
  2. Diagonal cutting pliers
  3. Wire strippers
  4. Other varieties
- B. Wires and Cables
  1. Wire as a conductor
  2. Insulation--purpose and types
  3. Kinds of wire
  4. Cables and cords
  5. Wire size
  6. Wire termination methods
  7. Wiring plugs

Test Number _____

LI-U4

UNIT EXAM

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. Wire strippers are used to remove the insulation from wires. (T-F)

2. A stranded wire is less flexible than a solid wire of the same gauge. (T-F)

3. Soldering irons are available in many shapes, sizes, and wattage ratings. For general project work, a 25-35 watt iron is appropriate. (T-F)

4. A conductor provides a path through which electricity can easily flow. (T-F)

5. Plastic is a common conductor used on wires. (T-F)

6. A 24 gauge wire has a larger diameter than a No. 12 American Wire Gauge wire. (T-F)

7. When fastening a wire to a screw terminal, the wire should be wound around the screw in a clockwise direction. (T-F)

8. An insulator offers a difficult path for the flow of electricity. (T-F)

9. Connectors are generally used for a one-time, permanent contact between wires and cables. (T-F)

10. Diagonal-cutting pliers are designed for stripping wires. (T-F)

11. A chassis punch is commonly used to punch round holes in sheetmetal. (T-F)

12. Long-nose pliers are designed primarily for holding and bending small-gauge wires. (T-F)

13. A Phillips head screw can be driven by either a standard blade screwdriver, or a Phillips screwdriver. (T-F)

14 The proper strain relief knot to use when connecting a plug to an electrical cord is the __________ knot.
(A) Square, (B) Undertakers, (C) Granny, (D) Underwriters.

15. The best conductor for most electrical work:
(A) copper, (B) aluminum, (C) silver, (D) tin.

Name: ______________

Date: ______________

Period: ______________

TECHNICAL GLOSSARY

ADJUSTABLE WRENCH:	An open-end style wrench with adjustable jaw size. This type of wrench is made with one stationary jaw, and an adjustable jaw, operated by a thumb screw. This allows one wrench to be used on many different nuts or bolt sizes.
CABLE:	A group of insulated wires held together by an outer covering.
CENTER PUNCH:	A metal punch with a sharp point. The center punch is used to mark the location of a hole that is to be drilled,preventing drill "wandering."
CHASSIS PUNCH:	A sheetmetal punch designed for punching round holes in a range of sizes from 1/2" to 3". The punch halves are drawn together with a machine screw.
CONDUCTOR:	A material through which electricity will easily flow. Wire is a conductor or conducting material.
CONNECTOR:	A device at the end of a wire or cable used to connect the wires to or disconnect the wires from the equipment.
DIAGONAL-CUTTING PLIERS:	Pliers used for cutting soft metal wire. Two popular terms used for identifying these pliers are diagonals and dykes.
FILE:	A tool used mainly to smooth the edges of sheetmetal, and to do small amounts of cutting, shaping, and fitting of metal parts.
GAUGE:	A standard method for sizing wires. Gauge sizes are given as numbers, such as 24 gauge or 24g. The lower the number, the larger the diameter of the wire.
HEAT SINK:	A small tool used to draw heat away from an electrical part or connection during the soldering process.
HEX WRENCH:	A six sided wrench used for removing Allen head set screws or bolts.
INSULATION:	A material which does not allow electricity to flow through it. Insulation is placed around a wire, connection, or joint to prevent a short circuit or an accidental shock.
JACK:	A plug-in device or recepticle which accepts a matching plug to complete a connection.

Name: ______________ ___

Date: ________________

Period: ________________

LONG-NOSE PLIERS:	Pliers used primarily for handling small objects and for bending and shaping wires. Most long nose pliers also have a cutting jaw for cutting small gauge wires.
LUG:	A terminal or device which is designed for easily attaching wires or electrical parts. Most lugs require that the wire be wrapped on and soldered.
NUT DRIVER:	A tool designed to rapidly install or remove nuts. The tool resembles a socket wrench attached to a screwdriver handle.
PLUG:	The male half of a connector which is plugged into a matching jack or socket.
PORTABLE ELECTRIC DRILL:	A hand-held power tool used for drilling holes in various materials. The tool uses a chuck to hold the drill bit and generally has a trigger style switch as a control.
REAMER:	A tapered tool used to slightly enlarged holes drilled in sheetmetal.
SCALE:	A tool marked off in divisions and used for measuring length or distance. A one foot ruler is a type of scale.
SCREWDRIVER:	A tool which allows you to produce a twisting motion to tighten or loosen screws. The two common tip types are slotted or standard and Phillips-head.
SCREW TERMINAL:	A type of connector which uses a screw to hold or connect a wire in place. Screw terminals are often found on the back of speakers, on AC plugs, etc.
SHEETMETAL NIBBLER:	A special cutting tool used to nibble away small bits of sheetmetal. A nibbler can be used to cut irregular shaped holes in sheetmetal.
SLIP JOINT PLIERS:	A common type of plier designed for holding or gripping work. The slip joint permits the jaws to be opened wider.
SOLDER:	A mixture of tin and lead, which is melted into an electrical connection to form a bond.
SOLDER AID:	A tool used to bend wires for easy connection to terminals or lugs. Solder aids may also contain a brush or pointed probe for clearing terminals of solder.
SOLDERING IRON:	A tool used to provide the heat required when making a solder connection.

Name: ____________________

Date: ____________________

Period: ____________________

SOLDERLESS TERMINAL:	Also called a solderless connector or crimp connector, these devices do not require soldering, rather, the wire is inserted into a lug, and the lug is squeezed with a special tool, to make the electrical connection.
SOLDER REMOVER:	A device used to remove molten solder from a wire or connection. Most desoldering tools draw the molten solder from the connection with a vacuum or suction force.
SOLID WIRE:	A type of wire that consists of only one solid conductor, usually covered by insulation.
SPLICE:	A method for connecting two or more wires together. Example: Tap splice, Rat-tail splice, or Western Union splice.
STRANDED WIRE:	A type of wire which consists of many strands of fine wire twisted together. The twisted conductors are then covered with an insulating material. Stranded wire is more flexible than solid wire of the same gauge.
STRIPPING:	The process of removing the insulating material (plastic, cloth, enamel) from a wire or conductor.
TERMINATION:	The ending of a wire or wire connection.
TIN SNIPS:	A scissors like tool used for cutting sheetmetal.
UNDERWRITERS KNOT:	A special strain relief knot used on electrical cords. If the cord is accidentally pulled, the knot will absorb the force, rather than the electrical connection.
VISE:	A tool used to securely hold work pieces while drilling, cutting, soldering, etc.. The most common style vise is called a bench vise, although many specialty vises are available for electronics work.
WIRE NUT:	A type of insulated solderless connector used for making Rat-tail joints. To use a wire nut, thread it onto a pair of bare conductors which are held parallel to each other. The conductor will twist and be held together firmly.
WIRE STRIPPERS:	A common tool used to remove the insulation from a conductor or wire.

SCORE:

GRADE:

Name:

Date:

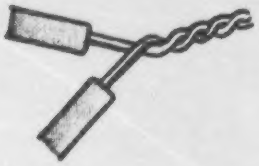
Period:

WORKSHEET

VOCABULARY - TOOL AND MATERIAL IDENTIFICATION

Identify the items pictured below: Use complete names:

1.



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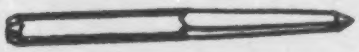

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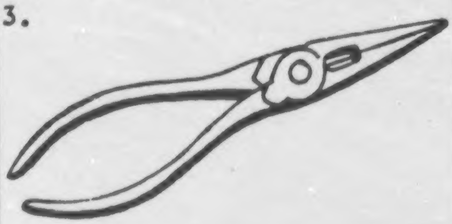

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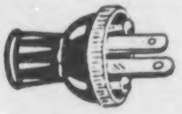

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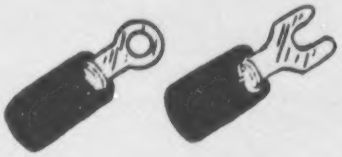

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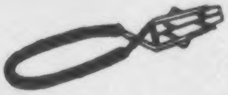

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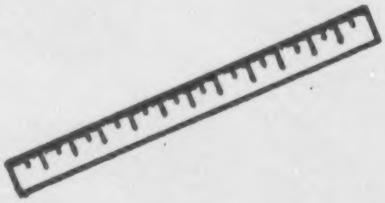

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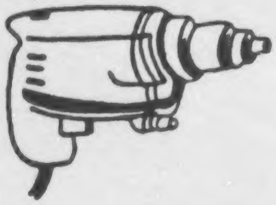

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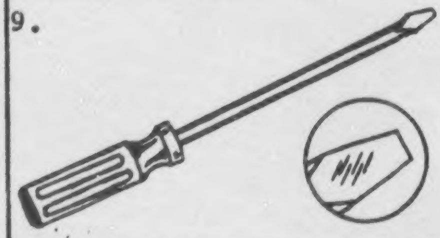

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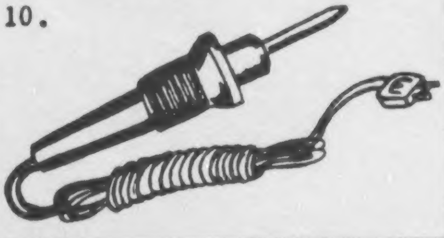


9.

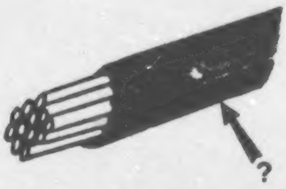
10.

Name: ______________________

Date: ______________________

Period: ______________________

11.



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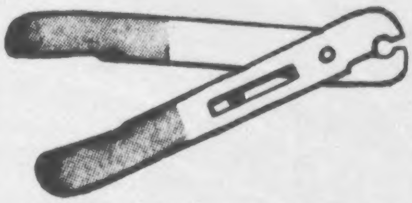
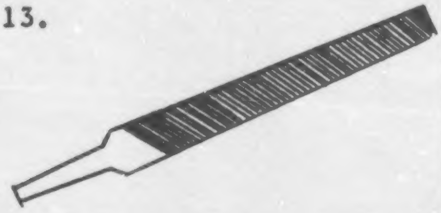


11. ☐

12. ☐

13.



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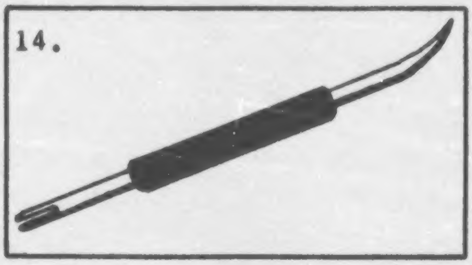
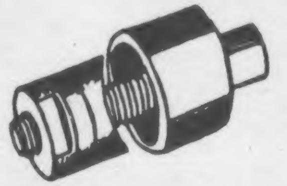


13. ☐

14. ☐

15.



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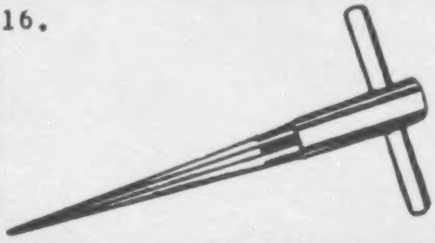

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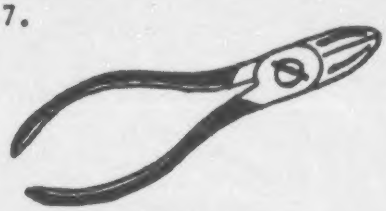

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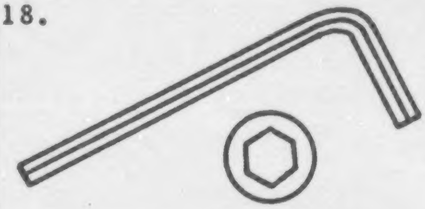
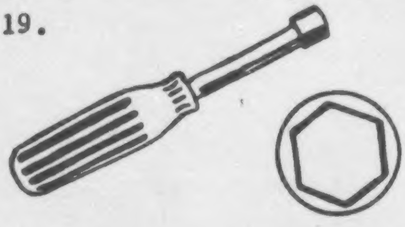


17. ☐

18. ☐

19.



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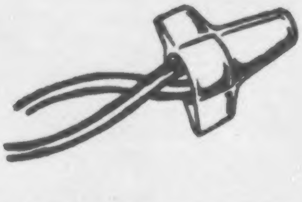


19. ☐

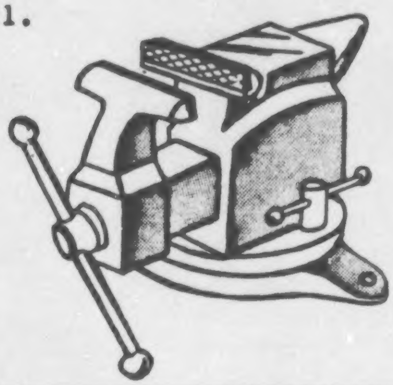
20. ☐

Name: ____________________

Date: ____________________

Period: ____________________

21.



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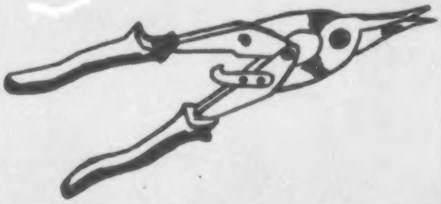
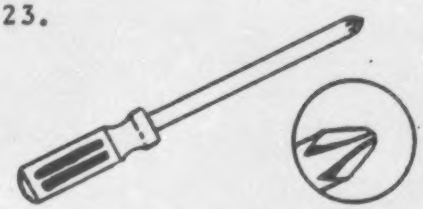


21. ☐

22. ☐

23.



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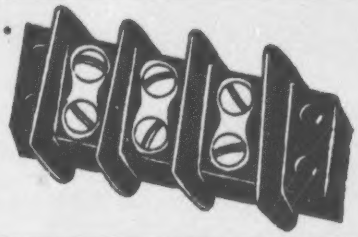
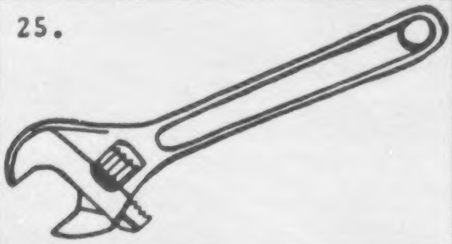


23. ☐

24. ☐

25.



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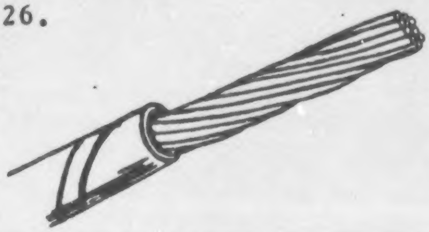
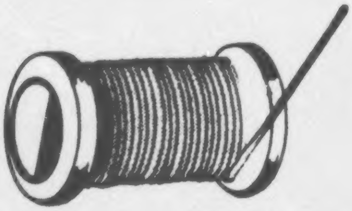


25. ☐

26. ☐

27.



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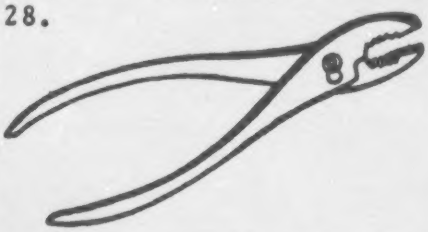

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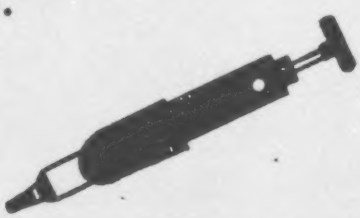

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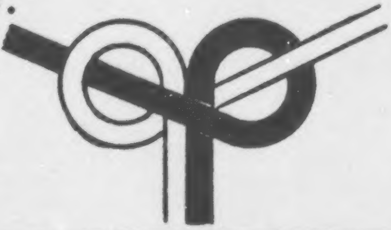


29. ☐

30. ☐

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

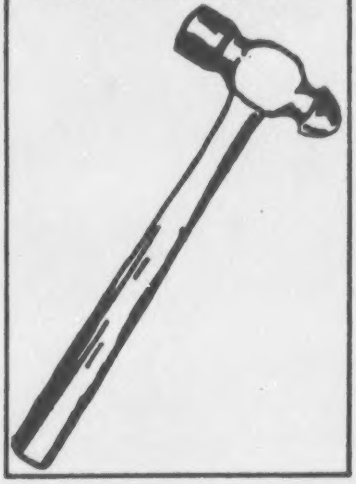
QUEST ACTIVITY

"UNIT 4"

GETTING ACQUAINTED WITH HAND TOOLS USED IN ELECTRONICS:

In this exercise you will draw a sketch of a number of basic electrical hand tools, write a simple statement about the tool's use, and list any safety precautions to observe when using the tool. To help in your work, if available, borrow the tool you are drawing from the tool cabinet and have it at your desk to handle and look at.

EXAMPLE:

A.	Ball Peen Hammer 	USE: 1. Hitting, striking, or forming metal. 2. Setting rivets	SAFETY: 1. Never hit two hammers together 2. Make sure handle is on tightly. 3. Do not put hammers on the edge of the table. 4. When hammering, hit away from other people. 5. Keep fingers away from the hitting area.
1.	Standard Screw-Driver	USE:	SAFETY:

Name: ____________________

Date: ____________________

Period: ____________________

2.	Wire Stripper	USE:	SAFETY:
3.	Diagonal Cutting Pliers	USE:	SAFETY:
4.	Long Nose Pliers	USE:	SAFETY:

Name: ____________________

Date: ____________________

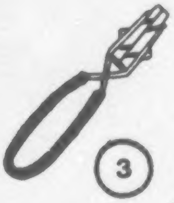
Period: ____________________

INFORMATIONAL HANDOUT

TOOLS AND EQUIPMENT I MAY NEED

The following tools, and materials are considered as "basic equipment" for building or repairing of electrical projects.

1. Diagonal cutting pliers
2. Long nose pliers
3. Heatsink
4. Soldering iron (appropriate wattage)
5. Thin solder (rosin core 60-40)
6. Solder aid
7. Wire stripper
8. Solder "Sucker" remover
9. Knife
10. Assorted type/size screwdrivers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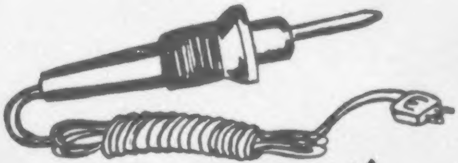
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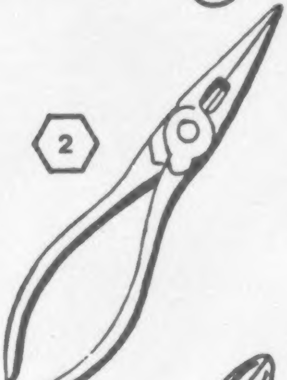
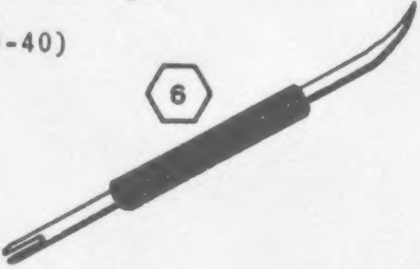

2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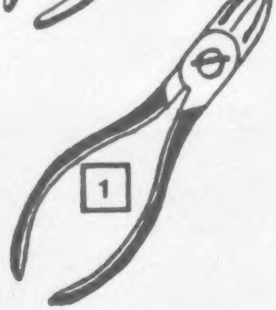
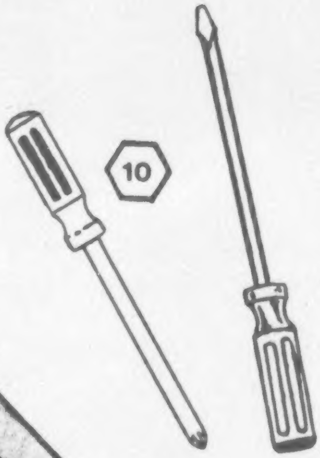

1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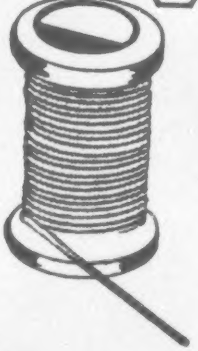
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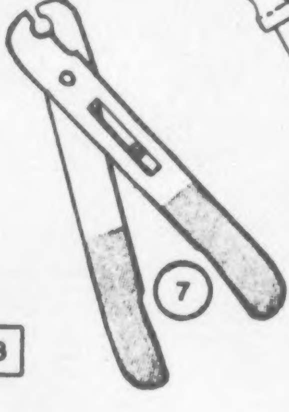
8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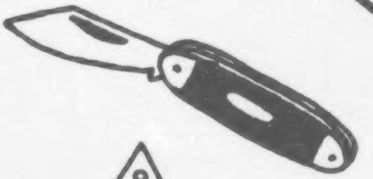

9

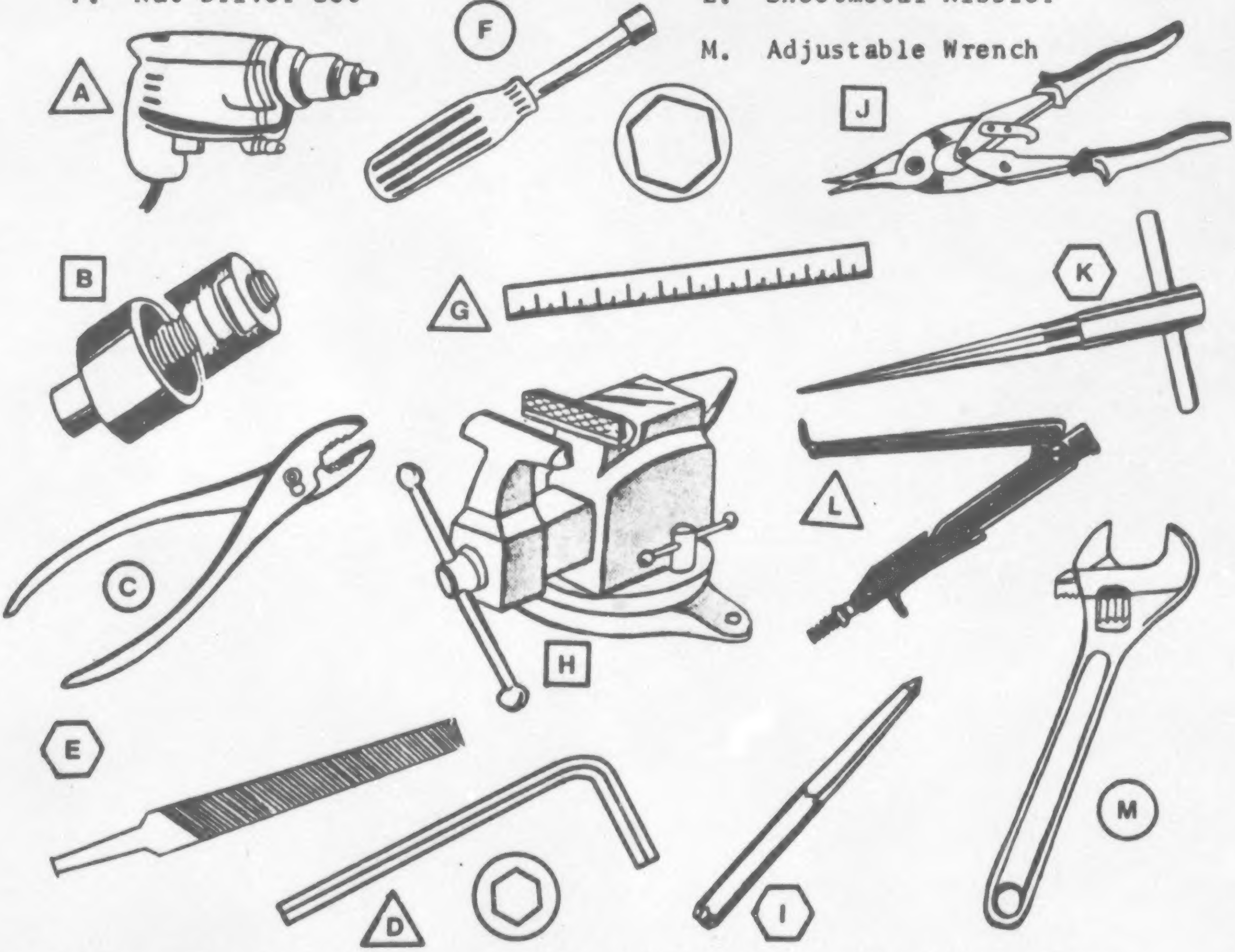
Name: ____________________

Date: ____________________

Period: ____________________

The following items may be needed and should be available in your school laboratory:

- A. Portable Electric Drill and Bits
- B. Chassis Punch Set
- C. Slip Joint Pliers
- D. Hex Wrenches
- E. Assorted Miniature Files
- F. Nut Driver Set
- G. Scale or Ruler
- H. Vise
- I. Center Punch
- J. Tin Snips
- K. Reamer
- L. Sheetmetal Nibbler
- M. Adjustable Wrench



Remember, selecting the proper tools--using them wisely, often makes the difference between a rough, rancid, rookie job and a slick, super, professional one. Each tool works in its own special way so always select tools to fit the construction task.

Name: ____________________

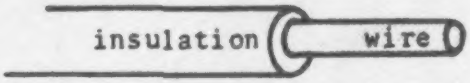
Date: ____________________

Period: ____________________

INFORMATIONAL HANDOUT

WIRE: PURPOSE AND USE

PURPOSE -

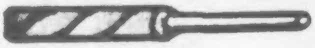


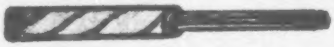
Wire is an important part of all electrical circuits and you should review some of the main factors to be considered when selecting or using wire.

A conductor (wire) provides the path or highway for the movement of electrons, and many times wire is covered with insulation to keep the electricity safely within the wire.

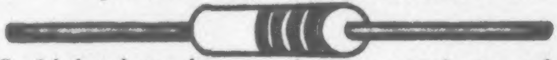
CONDUCTOR + INSULATOR = WIRE
CONDUCTOR - INSULATOR = BARE WIRE

Types of Wire -





Solid wire is usually made from one thick copper thread. It is easy to handle and to solder, yet, when a lot of movement is necessary this kind of wire should not be used. You can buy this wire in a variety of outside colors and sizes. Components like resistors, capacitors, inductors, and transformers have solid wires (leads) extending from the body of the device so that the component may be connected securely to the circuit.

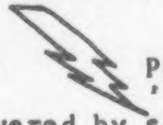


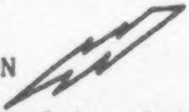
USAGE EXAMPLE: Solid wire is used to complete electrical circuits in the walls of homes, schools and industries.

Stranded wire is made from a bunch or group of copper threads that have been twisted together to appear like one wire. When flexibility or movement is important this is the type of wire to use. Remember that you must really be careful when stripping this kind of wire or some of the strands will be broken. Stranded wire is generally tinned with solder before being connected to a circuit point.

USAGE EXAMPLE: Stranded wire is used in cables, appliances, and extension cords.

WIRE INSULATION - PROTECTION



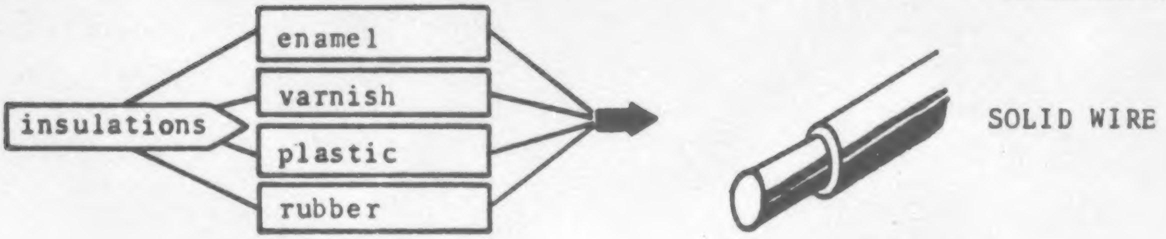


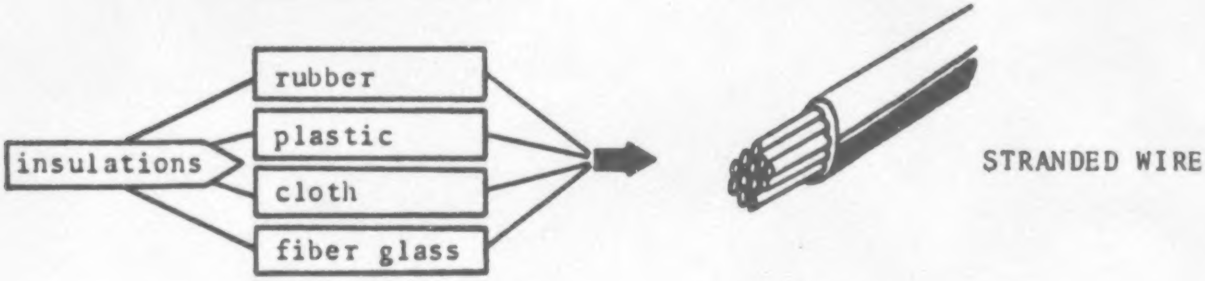
Most wires are covered by some kind of insulating material to prevent short circuits and dangerous accidents! Look at the various types of coverings used with each kind of wire on the following page.

Name: ______________

Date: ______________

Period: ______________


insulations
enamel
varnish
plastic
rubber
SOLID WIRE

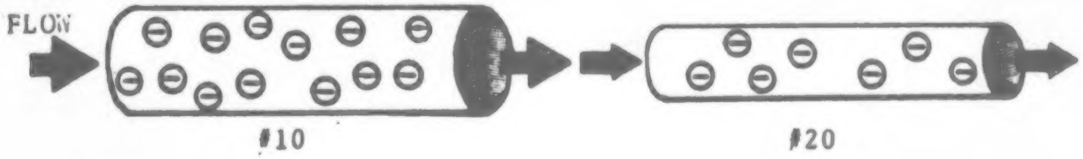

insulations
rubber
plastic
cloth
fiber glass
STRANDED WIRE

WIRE SIZES -

The American Wire Gauge (AWG) number is a system of describing by number, the size or electrical capacity of the wire. The larger the wire number, the smaller the diameter of the wire. Of course, it is important to select the proper size of wire for the job at hand.

NOTE: A wire gauge is a device that can be used to determine the size of wire.

SIZE EXAMPLE: A #20 wire can carry less electricity than a #10 wire because the #20 is physically smaller in size, hence less current can travel through this wire.



WIRE IN GENERAL

Most wire is now made from copper because it is such a good conductor of electricity and can be purchased at a fair price. Silver is rated as a better conductor, however, it is far more expensive which means increased cost, thus, it is seldom used by manufacturers.

COPPER ALUMINUM GOLD

Name: ____________________

Date: ____________________

Period: ____________________

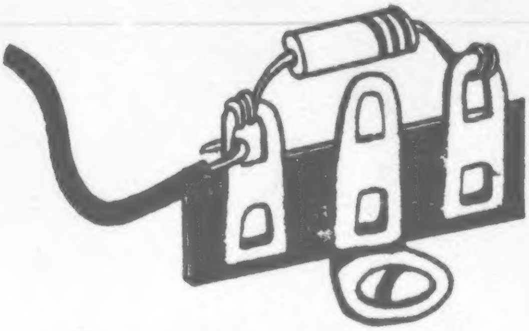
INFORMATIONAL HANDOUT

WIRE TERMINATION METHODS

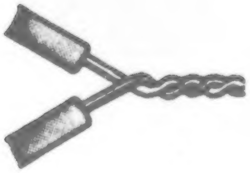
WIRE TERMINATION METHODS:

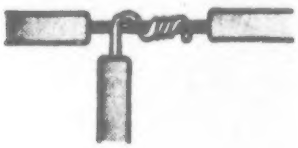
After routing a wire to a location in a project, how do you finally end or secure the wire connection? There are several approved methods, some of which are pictured below.

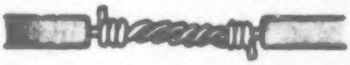
① Attach the wire directly to a pin or terminal LUG



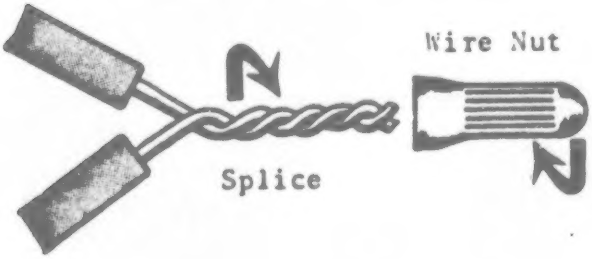
② Use a **SPLICE** to connect one wire to another. Splices are generally soldered and then insulated with black electrical tape.







③ A **WIRE NUT** can be used to mechanically hold wires together. Soldering is not required.

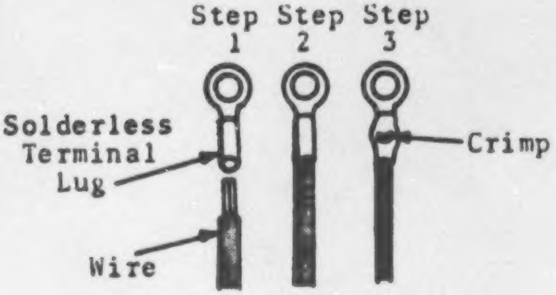


Name: ______________

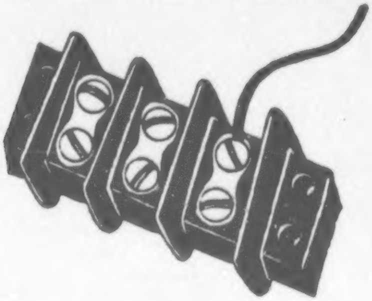
Date: ______________

Period: ______________

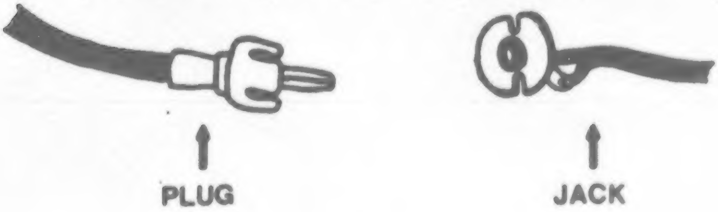
④ Various types of **CRIMP OR SOLDERLESS TERMINALS** are available for connecting wires together, or attaching a cap or lug to the wire end.


Step 1
Step 2
Step 3
Solderless Terminal Lug
Crimp
Wire

⑤ **SCREW TERMINALS** provide another method for securing a wire. Usually the wire is tinned, formed into a loop or hook, and placed under the head of the screw. The screw is tightened down completing the connection.



⑥ Many times, wires are attached to a **PLUG OR JACK CONNECTOR.** These devices allow the wire connection to be plugged together (joined) or pulled apart (disconnected).



SCORE:
GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM LI-U4

	T A	F B	C	D		T A	F B	C	D		T A	F B	C	D		T A	F B	C	D
1.	■				26.					51.					76.				
2.		■			27.					52.					77.				
3.	■				28.					53.					78.				
4.	■				29.					54.					79.				
5.	■				30.					55.					80.				
6.		■			31.					56.					81.				
7.	■				32.					57.					82.				
8.	■				33.					58.					83.				
9.	■				34.					59.					84.				
10.		■			35.					60.					85.				
11.	■				36.					61.					86.				
12.	■				37.					62.					87.				
13.		■			38.					63.					88.				
14.				■	39.					64.					89.				
15.	■				40.					65.					90.				
16.					41.					66.					91.				
17.					42.					67.					92.				
18.					43.					68.					93.				
19.					44.					69.					94.				
20.					45.					70.					95.				
21.					46.					71.					96.				
22.					47.					72.					97.				
23.					48.					73.					98.				
24.					49.					74.					99.				
25.					50.					75.					100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 4

A. TOOL AND MATERIAL IDENTIFICATION

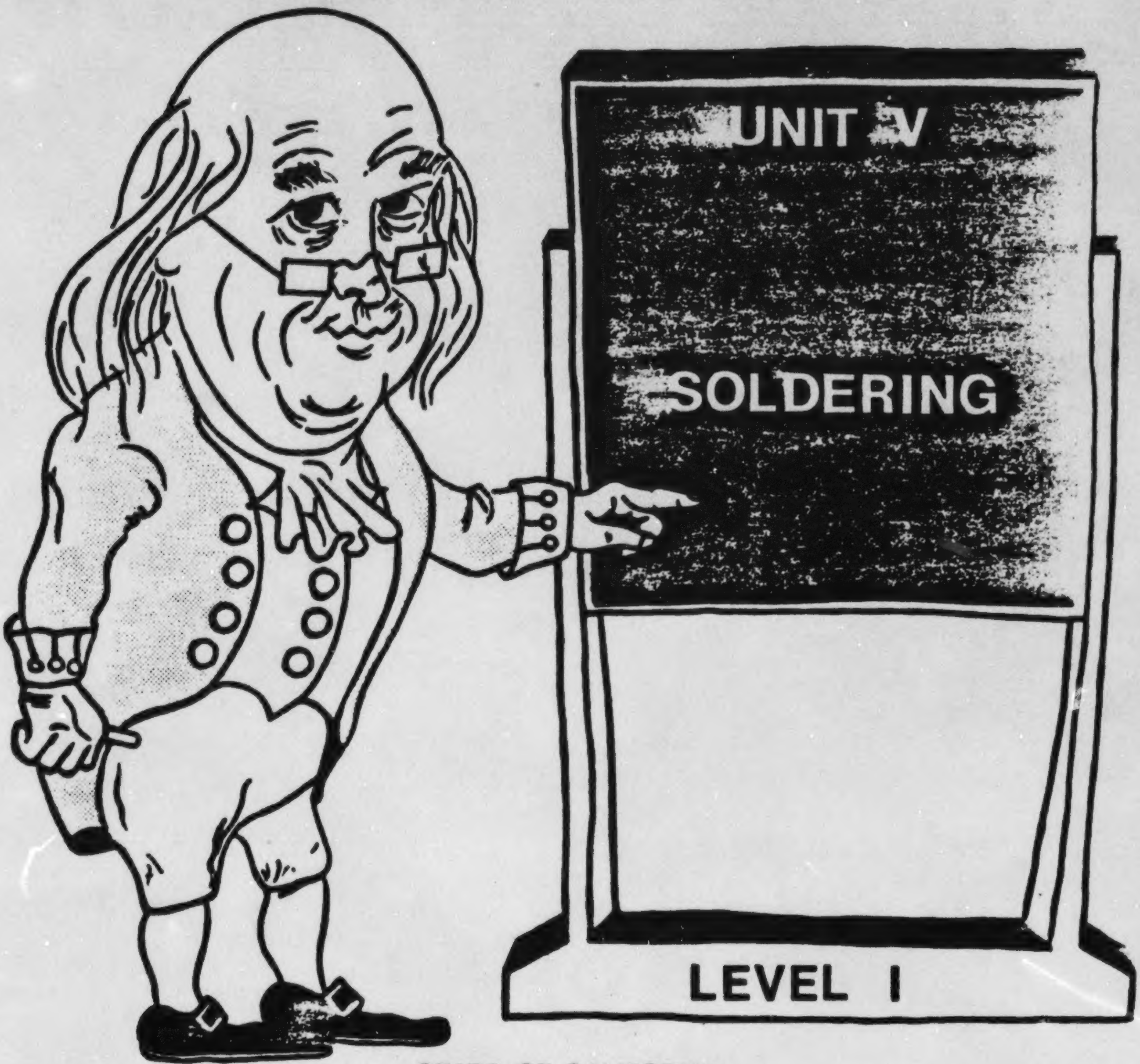
1. Rat-tail splice
2. center punch
3. long nose pliers
4. AC plug
5. solderless connector
6. heat sink
7. scale
8. portable electric drill
9. standard blade screwdriver
10. soldering iron
11. insulation
12. wire stripper
13. file
14. solder aid
15. chassis punch
16. reamer
17. diagonal cutting pliers
18. Allen wrench
19. nut driver
20. wire nut
21. bench vise
22. aviation shears
23. Phillips screwdriver
24. screw terminal (barrier strip)
25. adjustable wrench
26. stranded wire
27. solder
28. slip joint pliers
29. solder remover
30. Underwriters knot

B. QUEST ACTIVITY

(subjective evaluation)

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT V
SOLDERING
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________
DATE STARTED____________
DATE COMPLETED________

BY
R. E. LILLO
N. S. SOFFIOTTO

Title of Unit: Soldering

Time Allocation: 1 week

Unit Goal:

To instil student confidence and competence in operating soldering devices, including knowledge related to the soldering process, wire preparation, solder, and soldering materials.

Unit Objectives:

The student will be able to:

1. describe the function, list safety precautions, and illustrate the correct use of each soldering device presented in this unit.
2. identify and demonstrate proper soldering techniques and methods of preparing wires for soldering.
3. explain the purpose of the following processes: soldering, tinning, mechanical connections and desoldering.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electronics Assembly and Fabrication Methods. S.R. Duarte and R.C. Duarte, McGraw-Hill Book Co., 1973. Chapters: 1, and 5-10.

Electronic Techniques. R.S. Villanucci, A.W. Avtgis, and W.F. Megow, Prentice-Hall, Inc., 1974. Chapters: 3-16.

Understanding Electricity and Electronics. Peter Buban and Marshall E. Schmitt, McGraw-Hill Book Co., 1975. Units: 24-28.

Overview:

Like Unit 4 this unit will also allow the student to physically develop skills and/or competencies that will form a foundation for future mechanical and electrical assembly tasks.

Unit 5 is a fun kind of activity unit because it focuses on an aspect of training that is stimulating and fascinating to students.

Technical justification for the soldering process in electrical work along with the fundamental soldering definitions and basic techniques should be the initial topics for the presentation.

Next, safety must be again emphasized as an on going process when working with tools and material.

The other major topics in this unit can be presented through laboratory demonstrations and activities. Remember, student expertise can be further enhanced by creating activities which are predicated on those competencies depicted in the unit outline.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. It is recommended that from the outset the use of safety glasses be a mandatory procedure during the soldering process. A method for sanitizing and cleaning should be available in the shop and utilized when appropriate, or on a regular basis.
2. To save wear and tear on table tops or shop benches it is beneficial to invest in some small circular boards or the equivalent and use them when students are soldering or doing any construction work. This will protect the workbenches and leave the shop environment in a more positive condition. Accidents, burns, and scratches over the year can really destroy the furniture. It is also smart to make or purchase holders for the soldering irons to help reduce damage caused by a misplaced "hot" iron.
3. Check the cords on soldering irons frequently for burns and exposed conductors. It is common practice that students will inadvertently burn their own iron's cord and create a potentiall dangerous situation. When purchasing a new soldering iron check to see if the cord can be replaced without physically having to splice the replacement line cord to the old cord.
4. One way to control solder is to hand it out in 6 inch pre-cut lengths. This should help reduce the overall consumption of this very expensive material.

Supplemental Activities and Demonstrations:

1. Many soldering demonstration charts are available free, so check around and pick several up. Mount these charts strategically around the classroom for student use.
2. When instructing or demonstrating desoldering techniques it is usually easy to procure old printed circuit boards which are loaded with components. Have students remove parts in an effort to develop their proficiency.
3. If available, demonstrate the use of other kinds of soldering devices. Do not overlook aids, solder suckers, heat sinks, and other support materials.
4. If student soldering exercises are the activity of the day be sure to walk around and examine student work and the general order in which it is being accomplished.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Word Decoding
5. Quest Activities
6. Informational Handout (A Four Step Guide to Soldering)
7. Informational Handout (Electrical Connections)
8. Unit Module Answer Keys

V. Soldering

A. Function--the Solder Bond

B. Solder and Solder Flux

C. Soldering Devices and Aids

D. Wire Preparation for Soldering

E. Soldering Wires to Lugs, Terminals, and Other Wire

F. Project Construction

Test Number ____

LI-U5

UNIT EXAM

SOLDERING

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. The type of solder used in electronic project construction is called 60/40 rosin core solder. (T-F)

2. A dull-colored, rough solder joint is acceptable as long as enough solder is used. (T-F)

3. A wire being soldered to a lug is usually first loosely fastened to the lug to hold it in place. (T-F)

4. Do not move or handle a newly soldered wire until the solder has completely hardened. (T-F)

5. The job of removing solder from a connection is done with a desoldering tool. (T-F)

6. Solder is a mixture of tin and flux. (T-F)

7. The process of coating a wire, terminal, or soldering iron tip with a thin layer of solder is called ________.

8. Solder used for electronic work usually contains one or more cores of ________ flux, which helps to clean the connection.

9. Joining together (twisting) two or more wires to form a permanent connection is called a ________.

10. When soldering parts which are easily damaged by heat, a tool called a ________ ________ should be used.

Name: ____________

Date: ____________

Period: ____________

TECHNICAL GLOSSARY

CONDUCTOR JOINT:	A method for connecting or attaching two or more wires together. A satisfactory conductor joint must be 1) mechanically secure - wires tightly twisted together, 2) electrically secure - the connection must freely pass electricity, and 3) covered with an approved insulation.
DESOLDERING TOOL:	A device used to remove molten solder from a wire or connection. Most desoldering tools draw the molten solder from the connection with a vacuum or suction force.
ELECTRICAL TAPE:	A black vinyl insulating tape used to cover exposed conductor joints.
FLUX:	A chemical used when preparing wires to be soldered. Flux helps remove dirt and oxides which aids in making a good solder joint. For electrical work use only rosin flux, which is available as a paste, or as a core in the solder itself.
MECHANICAL CONNECTION:	The process of attaching wires to terminals, or another wire, by twisting or bending them so that the connection remains snug even though it is not soldered.
SOLDER:	A mixture of tin and lead which is melted into an electrical connection to increase electrical contact, improve mechanical strength and to protect against oxidation. Solder used for electrical work is known as 60/40 rosin core. That is: 60% tin and 40% lead with a core of rosin.
SOLDER JOINT:	The process of cleaning, heating, and properly applying solder to a connection, splice, or joint.
SOLDERING IRON:	A tool, with a heated tip, used to heat a connection for soldering. The style of iron used for general electronic work is called a "pencil" iron and has a rating between 25 and 40 watts.
SPLICE:	A method for connecting two or more wires together. Example. Tap splice, Rat-tail splice, or Western Union splice.
TINNING:	The process of cleaning and coating with solder. Tinning is usually thought of as the job of preparing the heated tip of a soldering iron, but wires, terminals, and part leads are often tinned before making an electrical connection.

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

VOCABULARY - WORD DECODING

The words below have little meaning until they are decoded. Each letter actually stands for another letter in the alphabet. Your task is to break the code and decode each word. The example will get you started. The code will be the same throughout the worksheet.

EXAMPLE:

A.	H Q G U A X O P R O J E C T	A.	PROJECT
1.	P H S V X A _ _ _ _ _ _	1.	
2.	P G S W A Q _ _ _ _ _ _	2.	
3.	O V F F V F C _ _ _ _ _ _ _	3.	
4.	Q G P V F _ _ _ _ _	4.	
5.	P G S W A Q U G V F O _ _ _ _ _ _ _ _ _ _ _	5.	
6.	X G F W I X O G Q U G V F O _ _ _ _ _ _ _ _ _ _ _ _ _ _	6.	
7.	A S A X O Q V X Z S O Z H A _ _ _ _ _ _ _ _ _ _ _ _ _ _	7.	
8.	P G S W A Q V F C V Q G F _ _ _ _ _ _ _ _ _ _ _ _ _	8.	
9.	W A P G S W A Q V F C O G G S _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	9.	
10.	E A X D Z F V X Z S X G F F A X O V G F _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	10.	

SCORE:

GRADE:

Name: ______________

Date: ______________

Period: ______________

WORKSHEET

QUEST ACTIVITY

"UNIT 5"

In this activity, you will be able to try your hand at making three basic electrical splices - the rat-tail splice, tap splice, and Western Union splice. Obtain the materials listed below, and use your informational handout as a guide to complete a sample of each type of splice. Mount your completed splice in the areas provided, and turn in the assignment for grading.

MATERIALS REQUIRED:

- ●Safety glasses
- ●Soldering iron
- ●Solder 60/40
- ●6 pieces of #14-18 guage insulated wire 5" long
- ●Required hand tools

① RAT-TAIL SPLICE

1. Obtain safety glasses.
2. Plug in iron and tin tip as directed.
3. Obtain 2 pieces of solid wire about 5 inches long.
4. Remove about 1 inch insulation from one end of each wire.
5. With the right hand, twist these ends tightly around each other as demonstrated.
6. Finish the splice by cutting off the ends with the lineman's pliers.
7. Solder exposed twisted wire to a shiny finish.
8. Seek instructor's approval and then attach to sheet.

RAT-TAIL SPLICE

Name: ____________________

Date: ____________________

Period: ____________________

② TAP-SPLICE

1. Obtain safety glasses.
2. Plug in iron and tin tip as directed.
3. Obtain two pieces of solid wire about 5" long.
4. Remove about 3" of insulated covering from the end of the tap wire.
5. Remove about 1" of insulation from the middle of the main wire where the branch splice is to be attached.
6. Wrap the tap wire around the main as directed by instructor
7. Make two long turns and four short turns with tap wire.
8. Cut off the extra wire, and solder. Seek instructor's approval and attach to this lab.

TAP-SPLICE

③ WESTERN UNION SPLICE

1. Obtain safety glasses.
2. Plug in iron and tin tip as directed.
3. Obtain 2 pieces of solid wire about 5" long.
4. Remove 2" of insulation on each wire.
5. Cross the wires at their middle then twist the ends in opposite directions 3 to 4 times.
6. Twist each end sharply, at right angles to the run on the splice, and wind 3 full turns.
7. Cut off the excess ends and solder.
8. Seek instructor's approval and attach to this lab.

WESTERN UNION SPLICE

Name: ______________________

Date: ______________________

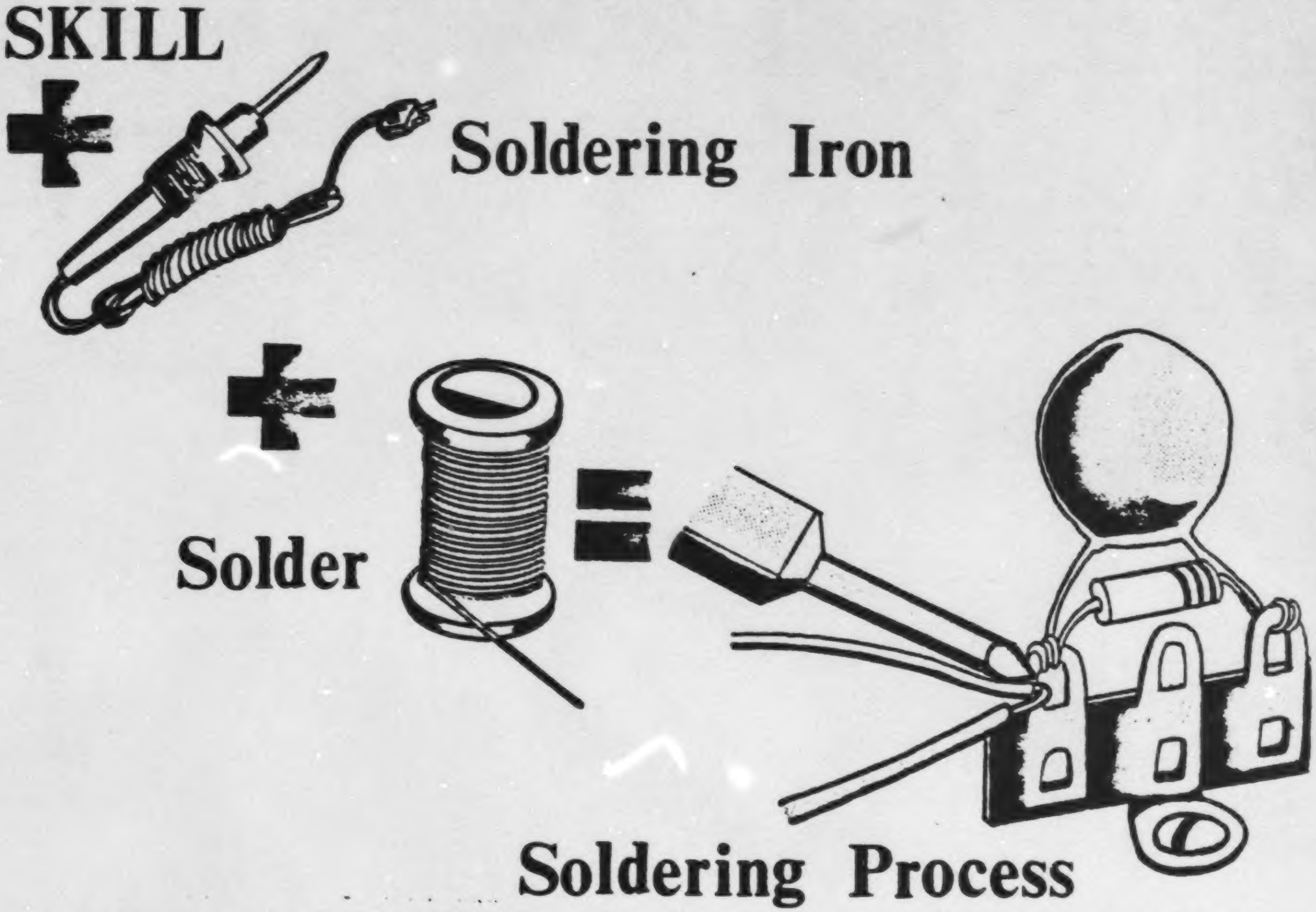
Period: ______________________

INFORMATIONAL HANDOUT

A 4 STEP GUIDE TO SOLDERING

INTRODUCTION: What is soldering?

In all Electricity/Electronics work, high quality soldering connections are important. Soldering allows the joining together, both mechanically and electrically, of metal objects (wires, component leads, etc.) using a material called solder and a heating device called a soldering iron.



Many times soldering is required to make sure that an electrical connection will last for a long time. Proper soldering will also ....

- Prevent corrosion
- Add strength

Name: ____________________

Date: ____________________

Period: ____________________

(SOLDERING ERROR)		(REMEDY)
● Not enough solder used	→	Apply more solder
● Too much solder used	→	Remove excess and reflow
● Improper heat application (cold solder joint)	→	Reheat and remove solder, then reflow

Desoldering Process:

Sometime you will have to remove soldered wires or parts from a project or mounting lugs or terminals, to do this the components must first be desoldered. Desoldering is basically the reverse of the soldering process. Study the list below of the steps that you should follow each time you desolder.

Obtain tools and materials
Plug iron in and clean tip
Tin the tip
Keep tip damp with sponge
Grasp wire or lead
Apply heat
Apply pressure / use solder removing tool
Remove part
Visual check/clean-up

SAFETY

When "resting" a soldering iron always use a soldering iron holder or stand.

Always hold a soldering iron by its handle and when reaching for it be alert and never accidently grab the "hot" tip.

Do not splash hot solder around by shaking the iron when soldering or desoldering.

Name: ____________________

Date: ____________________

Period: ____________________

① Selecting Soldering Tools and Materials:

Always use the correct tools and materials to complete the task; and remember, proper use of tools and materials will increase your skill and the quality of your work. Check the following list when preparing to solder.

- ☐ Safety glasses
- ☐ Proper wattage (heat) soldering iron and tip
- ☐ Rosin core solder - 60/40
- ☐ Solder aid
- ☐ Solder remover tool/braid
- ☐ Damp sponge
- ☐ Misc. hand tools
- ☐ Vise

② Soldering Procedures:

Correct soldering requires the learning of a skill, and the best way to learn a skill is to practice. Study the list below of the steps that you should follow each time it is necessary to solder.

- Obtain tools and materials
- Plug iron in and clean tip
- Tin the tip
- Prepare parts to be soldered
- Make mechanical connection
- Protect heat sensitive parts
- Apply solder
- Don't move parts
- Visual check/

③ Inspection:

Check your work immediately after the solder hardens to avoid making a poor soldering connection. Poor connections are generally caused by "three" specific problems. However, you can fix each of these problems by applying the remedies on the next page.

Name: ____________________

Date: ____________________

Period: ____________________

INFORMATIONAL HANDOUT

ELECTRICAL CONNECTIONS

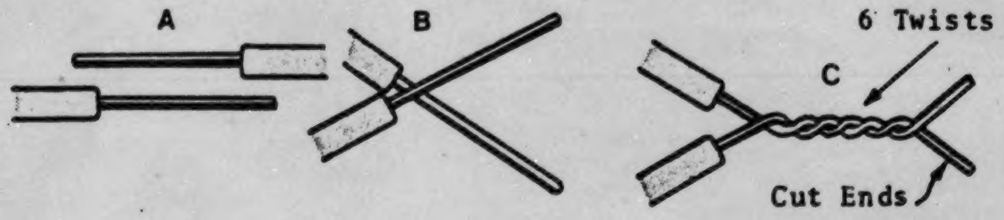
Electrical connections and electrical circuits must be reliable. Therefore, the individual who is wiring and soldering must be skillful. These sheets will help you master some basic wiring techniques, but remember it takes a great deal of practice to learn a skill, so lets get started!

Note, splices are hand-formed wire connections. The three most commonly used splices are the; Rat-Tail, Tap or Tee, and the Western Union.

3 Common Splices

Rat-Tail:

This splice is generally used where two or more wires are to be joined together. The Rat-Tail joint is commonly used in an electrical junction box, like the ones in your home. This splice should be soldered and taped, or a solderless connector (wire nut) used, before the box cover is replaced. Note, if wire sizes below AWG 14 are used the splice can no longer be formed by hand. Use pliers for twisting and be careful not to damage the wires. Follow the examples below when making this splice.



.....................then solder and tape.

Tap or Tee:

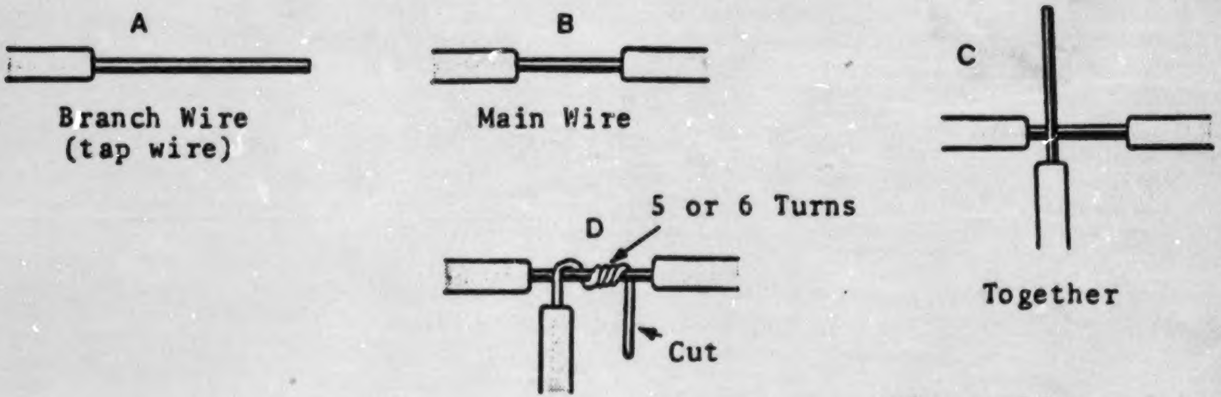
This splice is also used in home electrical wiring circuits. The Tap splice is used when you want to connect a branch conductor to a main wire or conductor. The advantage of this splice is that the main wire is not

Name: ____________________

Date: ____________________

Period: ____________________

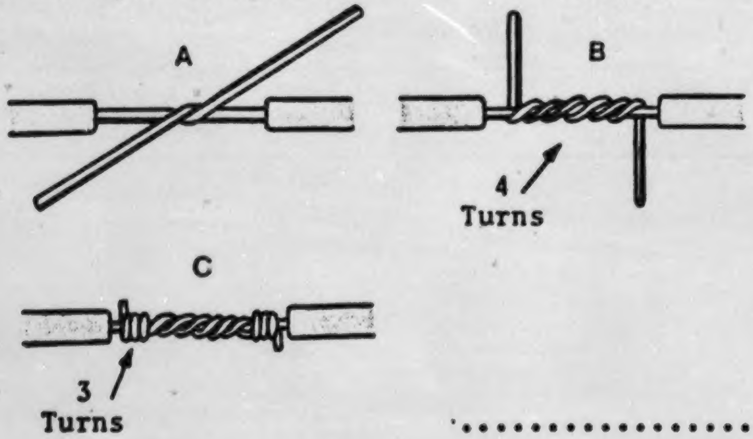
cut, just stripped where the branch wire is joined. This splice should be soldered and taped. Follow the examples given when making this splice.



....................then solder and tape.

Western Union:

This splice is the strongest of the three connections shown here, and the most interesting one to make. It is used for splicing a broken/cut wire in a long wire or to extend a wire a few more feet if it is short. This splice should be soldered and taped when completed. This splice has an interesting piece of history attached to its name. When the Western Union Telegraph Company had problems with breaks in telegraphic wires their workers would use this splice to repair the wire. Follow the examples given when making this splice.



....................then solder and tape.

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM LI-U5

	T	F		
	A	B	C	D
1.	■			
2.		■		
3.		■		
4.	■			
5.	■			
6.		■		
7.	tinning			
8.	rosin			
9.	joint			
10.	heat sink			
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100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 5

A. WORD DECODING

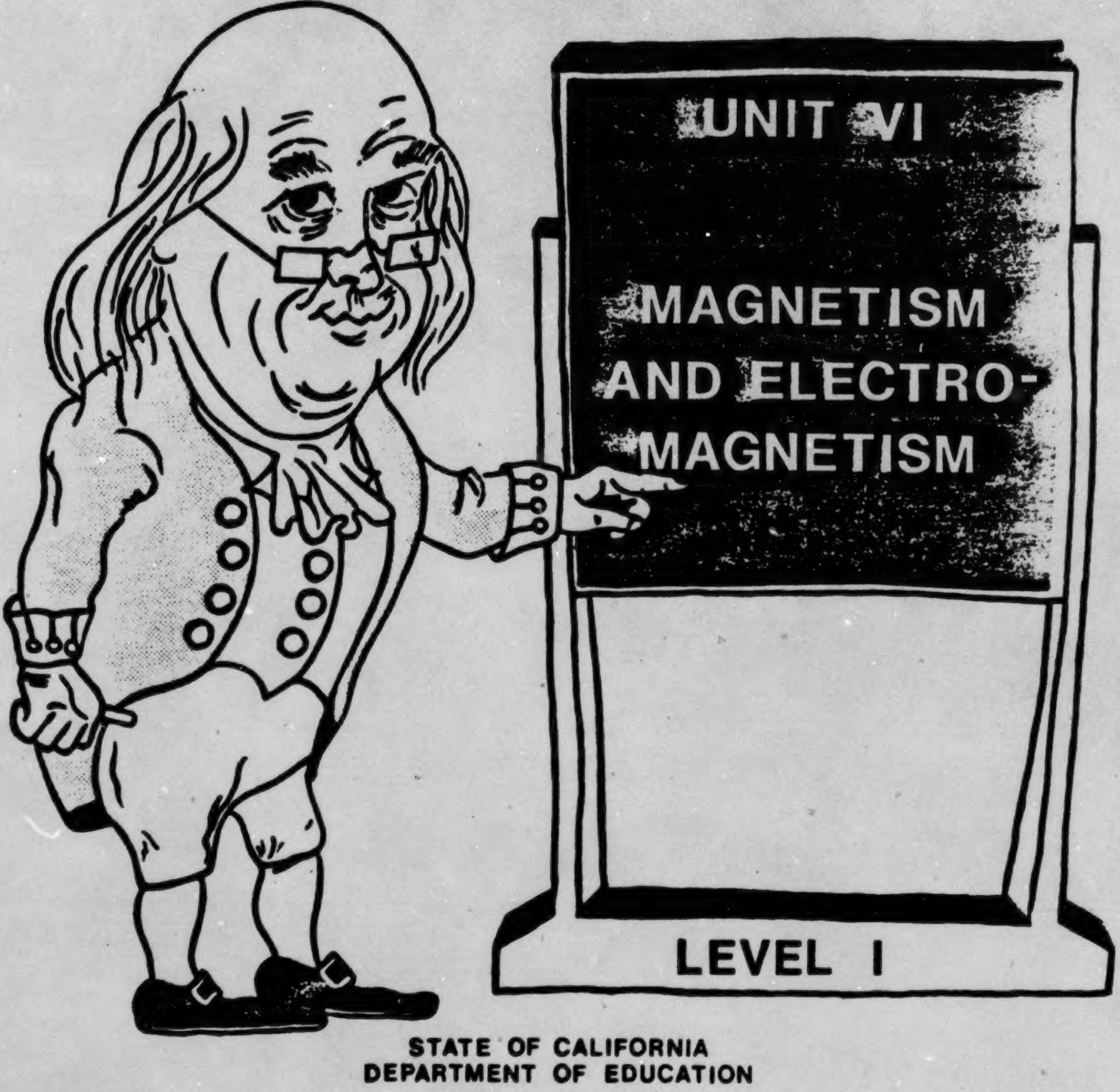
1. splice
2. solder
3. tinning
4. rosin
5. solder joint
6. conductor joint
7. electrical tape
8. soldering iron
9. desoldering tool
10. mechanical connection

B. QUEST ACTIVITY

(subjective evaluation)

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT VI
MAGNETISM
AND ELECTRO-
MAGNETISM
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________
DATE STARTED____________
DATE COMPLETED__________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #6

Title of Unit: Magnetism and Electromagnetism

Time Allocation: 1 week

Unit Goal:

To broaden and impart student competence in terms of comprehending the basic effects, application, and influence that both magnetism and electromagnetism have on their daily living and lifestyles.

Unit Objectives:

The student will be able to:

1. write or recite an explanation describing the characteristics of the phenomenon referred to as magnetism and/or electromagnetism
2. identify and list several common devices or appliances that use the principle of magnetism or electromagnetism in their operation.
3. explain the basic laws of magnetism related to the poles of a magnet, and describe the three fundamental categories for classifying magnets.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electricity and Electronics. Howard Gerrish and William Dugger, Goodheart-Willcox Co., 1978. Chapter: 4.

Industrial Arts Electricity. Clifford Lush and Glenn Engle, Chas. A Bennett Co., 1971. Chapter: 2 and 4.

Introduction to Electricity. Kurt Harding Schick, McGraw-Hill Ryerson Limited, 1975. Chapter: 2 and 9.

Overview:

Most students can identify some of hhe basic properties of magnets through their own personal experiences, hence the subject matter is not foreign and quite easy to introduce.

Stress that this topic has tremendous impact on the lives of each of us, and then trace the historical background of this topic prior to the technical presentation on types of magnets.

The next topic of emphasis should be the basic laws of magnetic attraction and repulsion, and while instructing in this area a discussion in reference to the Earth's magnetism would be appropriate.

Then Oersted's discovery is ideally suited as a point of origin for a discussion on electromagnetism.

Unit 6 should conclude with an emphasis on the uses or applications of both magnetism and electromagnetism in consumer products and in the generation of electricity.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. When demonstrating magnetic lines or flux with a magnet and iron filings be careful not to use an excessively strong magnet. Too intense of a magnet will not perform adequately because it forces the filings into groups rather than a uniform pattern.
2. Try and create with the students an atmosphere of importance about the concept of electromagnetism so that they realize that this topic is one of the most vital to the modern electrical era. Stress that Oersted's discovery has made possible countless devices from electromagnets to motors.
3. Before a lecture presentation use this activity to generate some enthusiasm. Obtain a small, working, black and white TV and tune it for a local channel. Bring a strong electromagnet close to the front of the C.R.T. and let the class watch the picture distort. Discuss the implication of what has been observed.
4. If a school budget is available and financially sound, try and order a simple assemble-disassemble type kit which will illustrate to students some of the fundamentals of magnetism/electromagnetism.

Supplemental Activities and Demonstrations:

1. A natural for this unit would be to have students build a simple electric motor kit. This kind of motor is generally designed for beginning kit builders and sold complete with a manual that includes information regarding the How and Why of its operation.
2. When demonstrating magnetic principles place a magnet or magnets on the stage plate of an overhead projector and then cover with a clear plastic sheet. Using a shaker, sprinkle some iron filings on top of the sheet, and discuss the pattern created. This can also provide an opportune time to discuss magnetic polarity and the basic law of magnetism.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Know Your Definitions
5. Quest Activities
6. Informational Handout (Classification of Magnets)
7. Informational Handout (Basic Law of Magnetism)
8. Unit Module Answer Keys

VI. Magnetism and Electromagnetism

- A. Magnetic principles
- B. Types of magnets
- C. Electromagnets
- D. Transformers
- E. Project Construction

Name: ____________________

Date: ____________________

Period: ____________________

TECHNICAL GLOSSARY

ATTRACT:	The action of drawing or pulling toward an object. For example; a magnet will attract a piece of soft iron.
BASIC LAW OF MAGNETISM:	A law that explains the interaction of magnetic fields. The law states: Like poles repel and unlike poles attract.
COMPASS:	A device which uses the earth's magnetic field, and a pivoted magnetic needle which will always point in a north direction.
ELECTROMAGNET:	A coil of insulated wire wrapped around a soft iron core which becomes magnetic when electricity is forced through it. The strength of the electromagnet depends upon the amount of electricity flowing through the coil, the number of turns of wire in the coil, and the type of core used. If the electricity flowing through the wire is turned off, the magnetic field stops.
FLUX LINES:	The lines of magnetic force which form around a magnet.
KEEPER:	A piece of soft iron placed across the poles of a magnet to "hold" the magnetic field within the magnet, and to prevent demagnetizing.
MAGNET:	A piece of iron, or a special material, which has an invisible force of attraction to materials such as iron, nickel, or cobalt.
MAGNETIC FIELD:	The space around a magnet which is controlled by the magnet.
MAGNETIC POLE:	The part of a magnet where the lines of force are the strongest. In every magnet there is one north-seeking pole (N-pole), and one south-seeking pole (S-pole).
MAGNETISM:	The invisible force, produced by a magnet, that allows it to attract magnetic materials, and to attract or repel other magnets or magnetic fields.
NATURAL MAGNET:	A material, such as "lodestone" or "magnetite," which in its natural state acts as a magnet.
PERMANENT MAGNET:	A man-made magnet which when magnetized will keep its magnetism. Steel or alnico are examples of material which can be made into permanent magnets.
REPEL:	The action of pushing away or forcing back of an object. A north pole of a magnet will repel the north pole of a second magnet.
TEMPORARY MAGNET:	A man-made magnet that loses its magnetism soon after the magnetizing force is removed. Magnetized soft iron is an example of a temporary magnet.

Test Number _____

LI-U6

UNIT EXAM

MAGNETS AND ELECTROMAGNETISM

IMPORTANT-
Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. A magnet will attract both iron and steel. (T-F)

2. A permanent magnet cannot be destroyed or weakened. (T-F)

3. As two magnets are moved apart, their force of attraction increases. (T-F)

4. Lodestone is a type of natural magnet. (T-F)

5. An electromagnet must have electricity flowing through it to produce a strong magnetic field. (T-F)

6. Around each magnet is: (A) a negative charge, (B) current, (C) a voltage, (D) a magnetic field.

7. A magnet which keeps its magnetism for only a short time is: (A) a permanent magnet, (B) made of soft iron, (C) a temporary magnet, (D) both B and C.

8. The basic law of magnetism says: (A) unlike poles repel, (B) like poles repel, (C) two south poles attract, (D) like poles attract.

9. Which of the following operates by magnetism or magnetic force? (A) electric motor, (B) electric buzzer, (C) electric bell, (D) all of the above.

10. Which pole of a magnet has the most magnetic strength? (A) N-pole, (B) S-pole, (C) both poles have equal strength, (D) will vary from one magnet to the next.

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

VOCABULARY - KNOW YOUR DEFINITIONS

MATCHING

Match the words below with the statement having a similar meaning.

1. Lodestone
2. Compass
3. Repel
4. Attract
5. Magnetic Field
6. Temporary Magnet
7. Basic Law of Magnetism
8. Keeper
9. Magnetic Pole
10. Electromagnet
11. Permanent Magnet
12. Flux Lines

A. A suspended magnetic needle which points north.
B. The space around a magnet which contains the flux lines.
C. Two N-Poles brought close together.
D. Electromagnet or soft iron.
E. A natural magnet.
F. Unlike poles attract, like poles repel.
G. One N-Pole and one S-Pole brought close together.
H. A coil of wire, wound around an iron core which has electricity flowing through it.
I. A piece of soft iron placed across the poles of a magnet.
J. The invisible lines of magnetic force around a magnet.
K. The part of a magnet having the strongest magnetic force.
L. A man-made magnet which will keep its magnetism for many years.

1. ☐
2. ☐
3. ☐
4. ☐
5. ☐
6. ☐
7. ☐
8. ☐
9. ☐
10. ☐
11. ☐
12. ☐

EXTRA CHALLENGE:

Draw a sketch of the magnetic field which surrounds the bar magnet below.

SCORE:	
GRADE:	

Name: ______________

Date: ______________

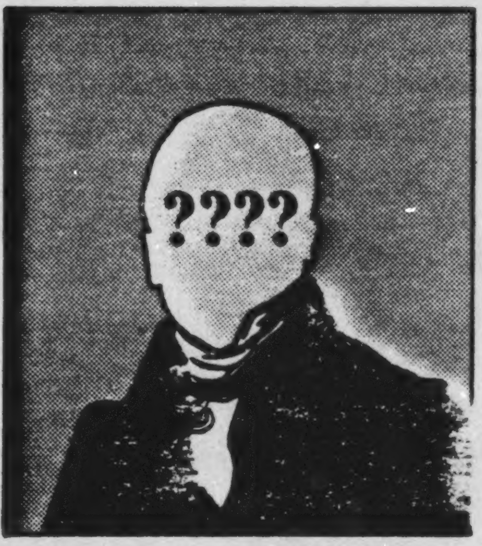
Period: ______________

WORKSHEET

QUEST ACTIVITY

"UNIT 6"

Using the clues below, identify this outstanding individual. Your school library or just an Encyclopedia will help you solve the mystery.



Fill in the names of the books used to solve this "Quest Activity":

1. ______________
2. ______________
3. ______________

WHO AM I....

****

- Awarded the Copley Medal
- Born in 1777
- Physicist/Chemist
- Believed magnetism and electricity similiar
- Helped establish the Royal Polytechnic Institute
- Discoverer of Electromagnetism
- Teacher
- Educated at University of Copenhagen, Denmark
- Discovered Aluminum
- Died in 1851

MY NAME IS.....

______________ ______________ ______________

Name: ______________

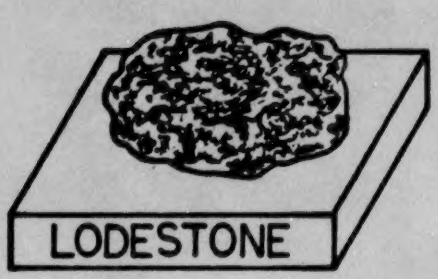
Date: ______________

Period: ______________

INFORMATIONAL HANDOUT

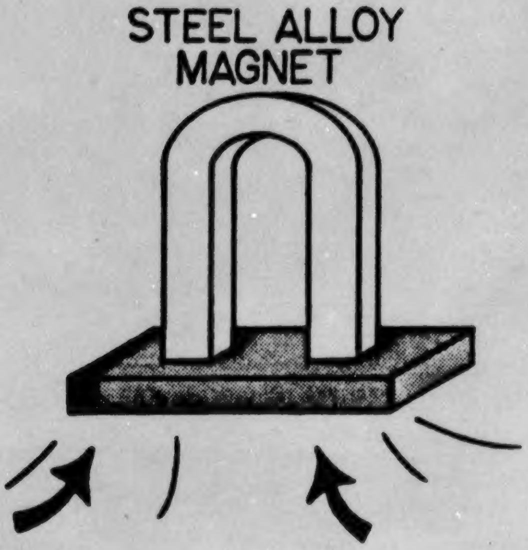
CLASSIFICATION OF MAGNETS

Any magnet can be classified as either natural, temporary, or permanent. Carefully study the descriptions below.



NATURAL

A natural magnet needs no special treatment by people to make it magnetic. Lodestone (or magnetite) is a natural magnet found on the earth. Especially large quantities can be found in the United States, however, these magnets are very weak and really serve little purpose in the modern world.



PERMANENT

A permanent magnet or man made magnet, keeps its magnetism for a long time. This type of magnet is produced from magnetic materials and can be made in many different shapes and sizes. They are used frequently in electrical appliances, hardware items, and compasses.

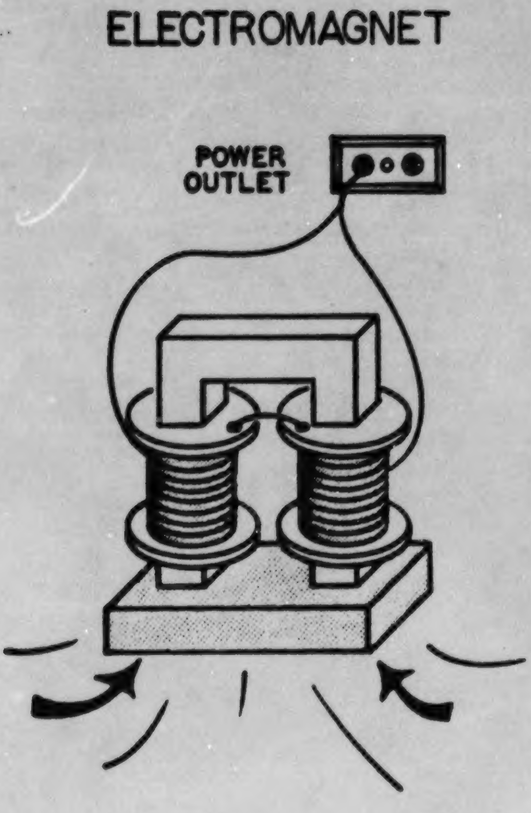
Name: ____________________

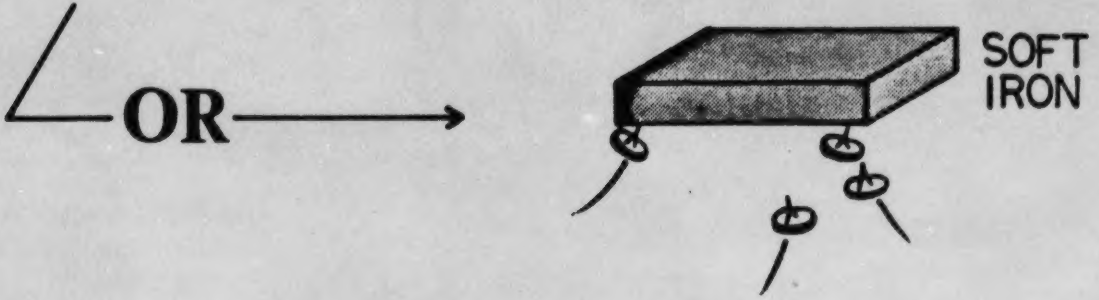
Date: ____________________

Period: ____________________

TEMPORARY

Temporary magnets are generally of two types, those made of material that do not keep their magnetism long (soft iron), and those which operate with the help of electricity (electromagnets). Electromagnets operate only when electricity is applied, when the electricity is removed they do not keep their magnetism.


ELECTROMAGNET
POWER OUTLET


OR
SOFT IRON

Name: ____________

Date: ____________

Period: ____________

INFORMATIONAL HANDOUT

BASIC LAW OF MAGNETISM

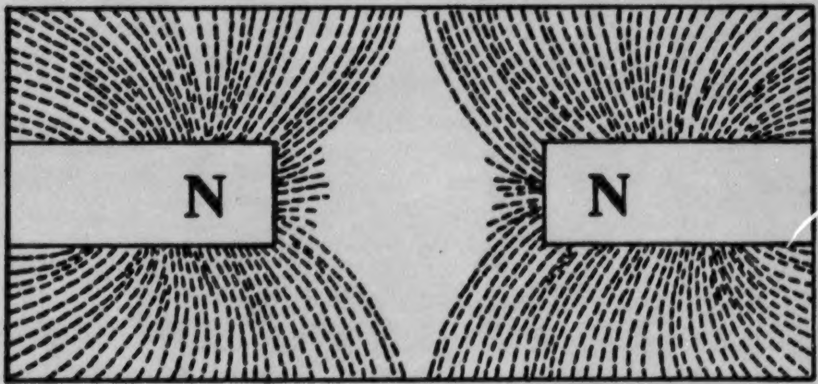
As you probably know from common experience, when two magnets are brought close to each other they will either pull together (attract), of push apart (repel). The action of the two magnets will depend upon the position of the magnetic poles. The basic law of magnetism explains the magnetic reaction in this way:

LIKE POLES REPEL

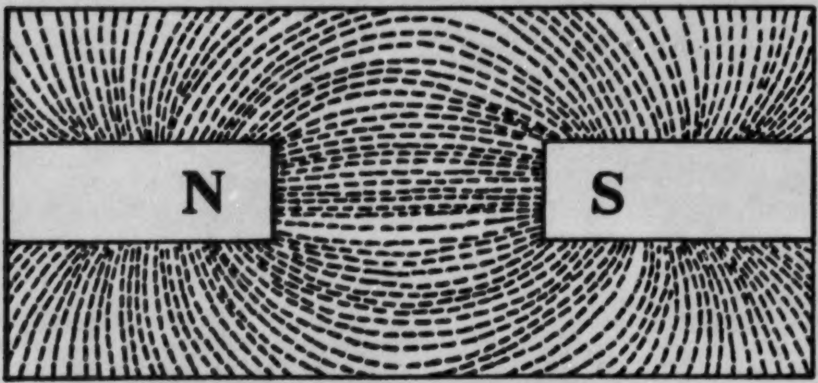
(N-POLE AND N-POLE REPEL AS WELL AS S-POLE AND S-POLE)

UNLIKE POLES ATTRACT

(N-POLE AND S-POLE ATTRACT)



Magnetic Repulsion



Magnetic Attraction

SCORE:	
GRADE:	

Name: __________________

Date: __________________

Period: __________________

ANSWER SHEET

EXAM LI-U6

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	A	B	C	D
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*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 6

A. KNOW YOUR DEFINITIONS

1. E
2. A
3. C
4. G
5. B
6. D
7. F
8. I
9. K
10. H
11. L
12. J

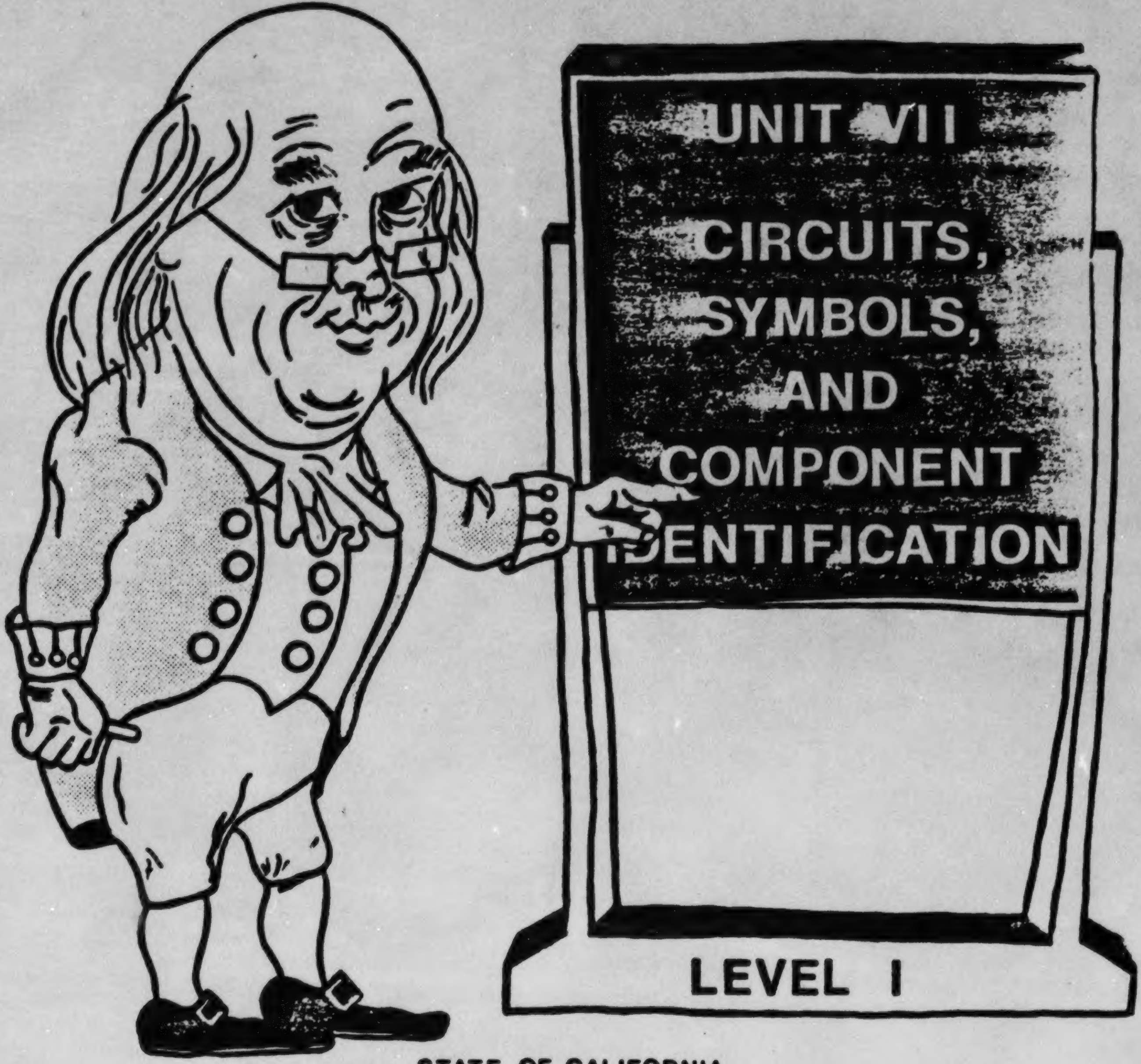
Extra challenge - (subjective evaluation)

B. QUEST ACTIVITY

Hans Christian Oersted

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT VII
CIRCUITS,
SYMBOLS,
AND
COMPONENT
IDENTIFICATION
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________

DATE STARTED____________

DATE COMPLETED________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #7

Title of Unit: Circuits, Symbols, and Component Identification

Time Allocation: 2 weeks

Unit Goal:

To investigate and transmit those competencies related to identifying fundamental electrical components, quantities, and their units of measurement, and to attain student competence in understanding the basic requirements of an electrical circuit.

Unit Objectives:

The student will be able to:

1. identify and draw the schematic symbols of the following common components: resistor, inductor, capacitor, switch, speaker, xenon flashtube, neon lamp, transformer, diode, battery and indicator lamp.
2. differentiate and identify the basic circuit parts of an electrical circuit, and demonstrate the ability to connect components either in a series or parallel configuration.
3. identify and explain the three common types of electrical quantities and their corresponding units of measurements.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electronics Assembly and Fabrication Methods. S.R. Duarte and R.L. Duarte, McGraw-Hill Book Co., 1973. Chapters: 2 and 4.

Introduction to Electricity. Kurt H. Schick, McGraw-Hill Ryerson Limited, 1975. Chapters: 3, 7, and 21.

Understanding Electricity and Electronics. Peter Buban and Marshall L. Schmitt, McGraw-Hill Book Co., 1975. Units: 2, 3, and 10.

Overview:

Several basic competencies are introduced in this unit, and these competencies can serve as a solid foundation for succeeding technical units throughout this level as well as future levels if they are acquired.

The unit should be presented carefully in terms of content. First, stress that symbols are utilized in schematic drawings as a means to explain where parts are electrically located. Second, instruction on component identification, with specific emphasis on those common components encountered in typical beginning type projects or kits.

Next, it is necessary to identify basic electrical terms and to emphasize that these quantities operate as a team when performing within a circuit. Once the definitions and functions have been firmly established it is relatively easy to associate letter symbols or units of measurement with the proper quantity.

Finally the requirements for a complete circuit may be evaluated.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. Be mindful when explaining circuit operation and terminology that very often first exposure to technical expressions can be misunderstood for example "current flow", "potential difference", and "voltage". Spend a significant amount of time with these kinds of terms in order to facilitate your students basic comprehension.
2. Present basic DC circuits by showing students that electrical parts or components comprise a system only when they are wired together to perform a desired result or function. This system can consist of a simple or complex circuit which has at its foundation a supply, control, conductor and load.
3. Do not be afraid to use the art of repetition as a means to drill or impress students with specific units of measurement or letter symbols. Use the blackboard also as an effective vehicle by listing a variety of terms and/or units, then let the students match up the correct pairs.
4. Investigate with the class a variety of components that they might typically encounter when building a simple project. Use an overhead projector and place a component on top of the stage plate and examine its size and shape, then, discuss the general purpose, special properties, value determination/codes, and symbol.

Supplemental Activities and Demonstrations:

1. Class can physically examine a box containing basic parts such as switches, wires, lamps, cells, batteries, bells etc., and categorize their functions on the blackboard in terms of circuit use; supply, control, conductor, or load.
2. Instructor can assemble several simple circuits to dramatize circuit operation, and by utilizing duplicate load devices can easily manipulate configuration into a series, parallel, or combination circuit. Circuit failures can be introduced along with troubleshooting and repair techniques if desired.
3. Many short story booklets on Electricity/Electronics are available from major companies. A letter written on school letterhead indicating a need for a classroom set will usually bring results and thus supplement basic reading materials and technical knowledge.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Cryptics
5. Worksheet - Electrical Symbols and Terms
6. Quest Activities
7. Informational Handout (The Electrical Team)
8. Informational Handout (Basic Electronic Components Used In Project Construction With Schematic Symbol and Letter Designation)
9. Informational Handout (Requirements for, and Types of Electrical Circuits)
10. Unit Module Answer Keys

VII. Circuits, Symbols, and Component Identification

A. Schematic Symbols
   1. Purpose

   2. Common circuit symbols

B. Component Identification

C. Electrical Terms and Vocabulary

D. Basic Units of Measurement

E. DC Circuits
   1. Requirement for a complete electric circuit

   2. Series circuits

   3. Parallel circuits

   4. Combination circuits

F. Project Construction

Test Number _____

LI-U7

UNIT EXAM

CIRCUITS, SYMBOLS, AND COMPONENT IDENTIFICATION

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. The letter abbreviation for voltage is V. (T-F)

2. On a schematic diagram, the components are shown as schematic symbols. (T-F)

3. A supply provides the electricity for circuit operation. (T-F)

4. Electrons always flow from negative to positive in an electrical circuit.

5. Motors, lamps, bells, and heaters can be used as loads in electrical circuits. (T-F)

6. The orderly flow of electrons through a circuit is known as:
   (A) current, (B) electromotive force, (C) resistance, (D) power.

7. A circuit which contains more than one path for current flow is known as a(n):
   (A) parallel circuit, (B) series circuit, (C) abnormal circuit, (D) normal circuit.

8. The letter abbreviation for voltage is the:
   (A) V, (B) VOL, (C) E, (D) B.

9. The letter abbreviation for current is:
   (A) C, (B) I, (C) A, (D) E.

10. "Ω" is the electrical symbol for the:
    (A) volt, (B) ampere, (C) resistor, (D) ohm.

11. To qualify as a complete electrical circuit, a supply, conductor, a load and a __________ are required.

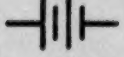
12. __________ is the opposition to the flow of electricity, through a circuit.

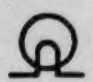
13. Voltage is measured in the basic unit __________.

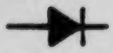
14. The ampere is the basic unit of measurement for __________.

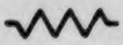
15. The ohm is the basic unit of measurement for __________.

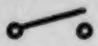
Identify the schematic symbols drawn below.

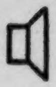
16.  ____________________

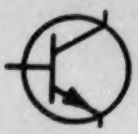
17.  ____________________

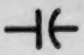
18.  ____________________

19.  ____________________

20.  ____________________

21.  ____________________

22.  ____________________

23.  ____________________

Identify the abbreviations or letter designations listed below.

24. LP: ____________________

25. C: ____________________

26. R: ____________________

27. B: ____________________

28. V: ____________________

29. S: ____________________

30. A: ____________________

Name: ____________________

Date: ____________________

TECHNICAL GLOSSARY

Period: ____________________

AMPERE:	The basic unit of measurement for current. Abbrev. A.
COMBINATION CIRCUIT:	A circuit consisting of one or more series and parallel paths. Combination circuits are often called series-parallel circuits.
COMPLETE CIRCUIT:	An electrical circuit which contains at least a; supply, load, control, and conductor. All complete electrical circuits must contain these 4 basic parts.
COMPONENT:	An electronic part.
CONDUCTOR:	The part of an electric circuit which forms the path through which electricity will flow. Copper wire is an example of a conductor.
CONTROL:	The part of a complete circuit which turns on, turns off, or routes (directs) electricity through a circuit. A switch is an example of a control.
CURRENT:	The orderly flow of electrons through a circuit. Current is measured in the basic unit amperes or amps. Letter symbol: I.
LETTER IDENTIFICATION:	A letter used to identify a particular type of electronic component. Example: The letter identification for a capacitor is C.
LOAD:	The device which a circuit is designed to operate. Common circuit loads are motors, lamps, speakers, heating elements, etc.
OHM:	The basic unit of measurement for resistance. Letter symbol:Ω
PARALLEL CIRCUIT:	A circuit which contains two or more paths for current flow, sometimes referred to as a shunt or branch circuit.
RESISTANCE:	The opposition that a component or circuit offers to the flow of electricity. Resistance is measured in the basic unit ohms. Letter symbol: R
SCHEMATIC SYMBOL:	A sketch used to identify an electronic component and often referred to as a graphic symbol.
SERIES CIRCUIT:	A circuit which allows only one path for current flow. Components connected in series are joined in a line, one after the other.
SUPPLY:	The device which provides, or supplies, the electricity needed for circuit operation. Some examples of supply devices are batteries, generators, and solar cells. The supply is often referred to as the source.

Name: ____________________

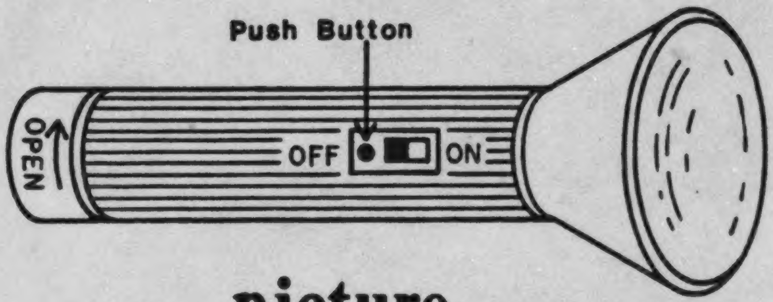
Date: ____________________

Period: ____________________

VOLT: The basic unit of measurement for voltage. Abbrev. V.

VOLTAGE: The electrical force or pressure which causes electrons to move through a circuit. Other terms for voltage are electromotive force and potential difference. Voltage is measured in the basic unit volts. Abbrev. E.

FLASHLIGHT


Push Button
OFF
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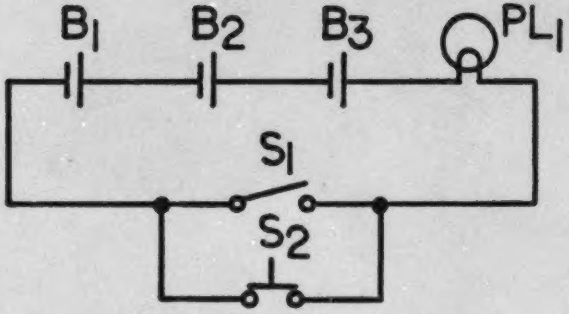
picture


B1
B2
B3
PL1
S1
S2

schematic

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

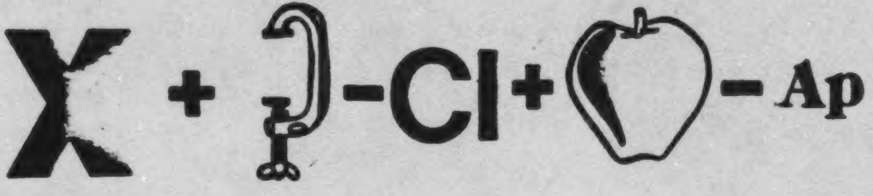
WORKSHEET

VOCABULARY - CRYPTICS

Decode the cryptic messages below to identify the electronic term.

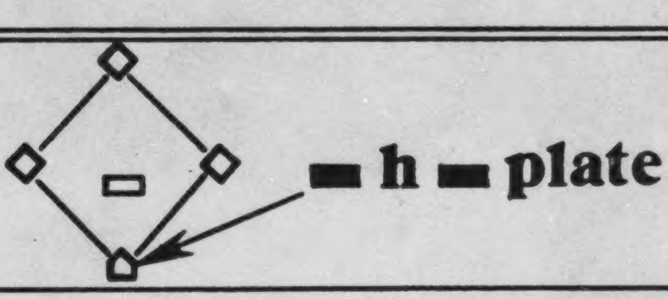
EXAMPLE:

A.



A. EXAMPLE

1.



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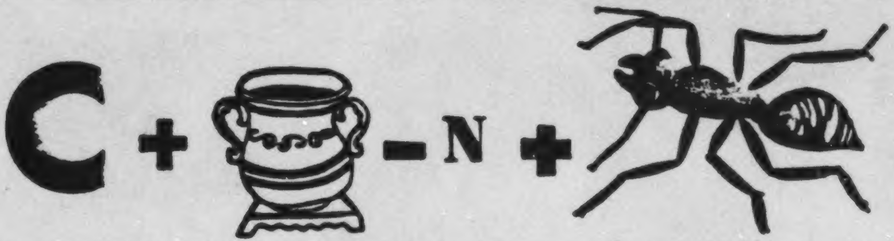
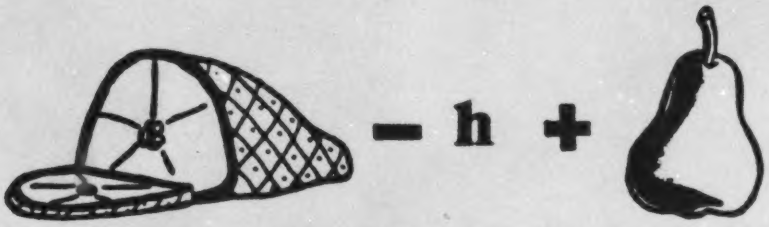
2.



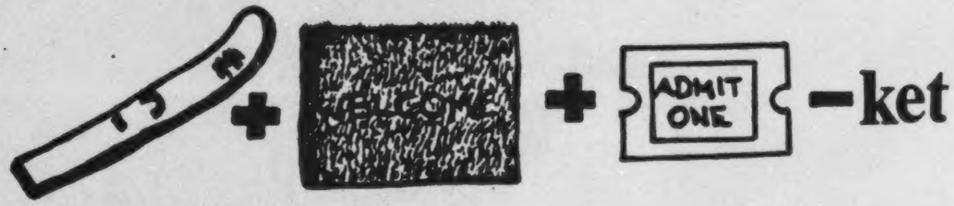
2. ☐

3.



3. ☐

4.


+
+
ADMIT ONE
-ket

4. ☐

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

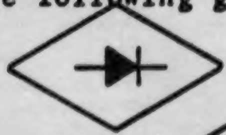
WORKSHEET

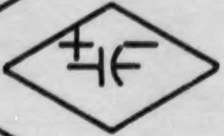
ELECTRICAL SYMBOLS AND TERMS

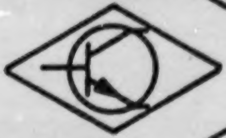
A. Draw in the correct schematic symbol for the following electronic components.

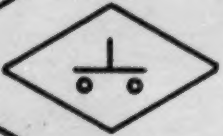
1. Battery:
2. Carbon composition resistor:
3. Disc capacitor:
4. Transformer:
5. Silicon controlled rectifier:
6. Incandescent lamp:
7. Single pole single throw slide switch:
8. Neon lamp:

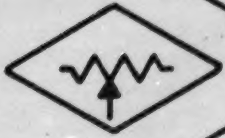
B. Identify the following graphic symbols:

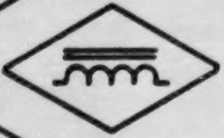
9.  . . . . ____________________

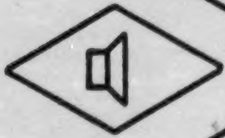
10.  . . . . . ____________________

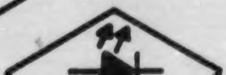
11.  . . . . ____________________

12.  . . . . . ____________________

13.  . . . . ____________________

14.  . . . . . ____________________

15.  . . . . ____________________

16.  . . . . .

Name: ____________________

Date: ____________________

Peri d: ____________________

C. Give the letter designation or abbreviation for the following.

17. current: _____

18. ohm: _____

19. capacitor: _____

20. battery: _____

21. switch: _____

22. light emitting diode: _____

23. resistor: _____

D. Identify the following letter designations or abbreviations.

24. L: ____________________

25. V: ____________________

26. Q: ____________________

27. D: ____________________

28. A: ____________________

29. E: ____________________

30. S: ____________________

SCORE:

GRADE:

Name: ____________________

Date: ____________________

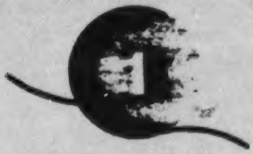
Period: ____________________

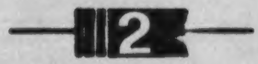
WORKSHEET

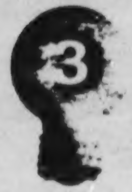
QUEST ACTIVITY

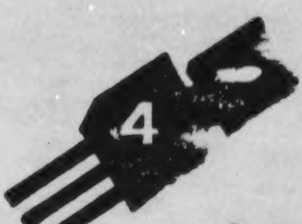
"UNIT 7"

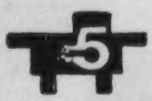
Identify the component drawings shown below.

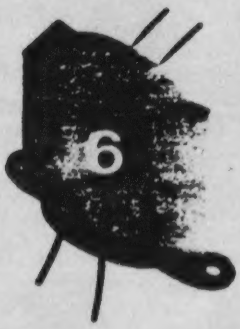
1.


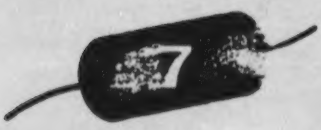
2.


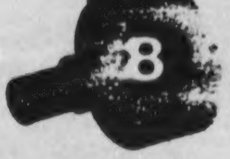
3.


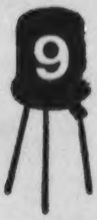
4.


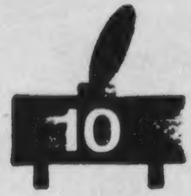
5.


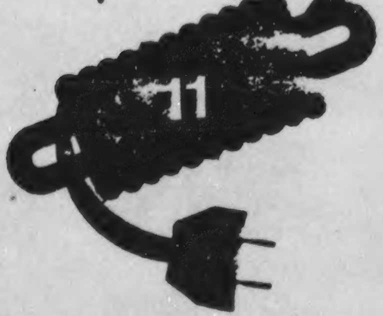
6.


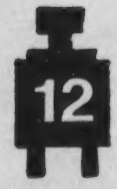
7.


8.


9.


10.


11.


12.


1. ☐
2. ☐
3. ☐
4. ☐
5. ☐
6. ☐
7. ☐
8. ☐
9. ☐
10. ☐
11. ☐
12. ☐

Name: ____________________

Date: ____________________

Period: ____________________

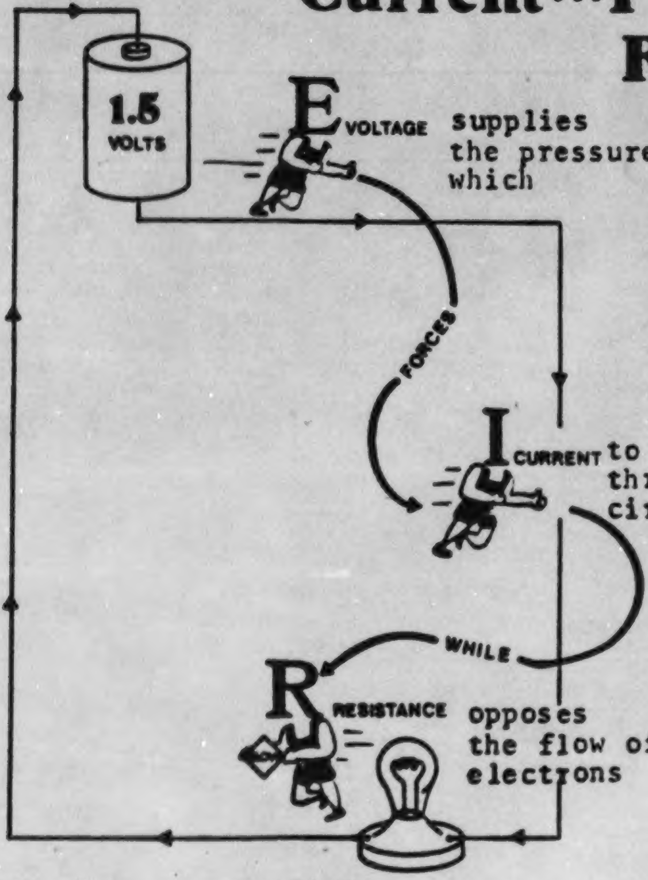
INFORMATIONAL HANDOUT

THE ELECTRICAL TEAM

Voltage…E

Current…I

Resistance…R


1.5 VOLTS
E VOLTAGE
FORCES
I CURRENT
WHILE
R RESISTANCE

supplies the pressure which

to flow through a circuit

opposes the flow of electrons

Units of Measurement

Voltage is measured in the basic unit *volts* (V)

Current is measured in the basic unit *amperes* (A)

Resistance is measured in the basic unit *ohms* (Ω)

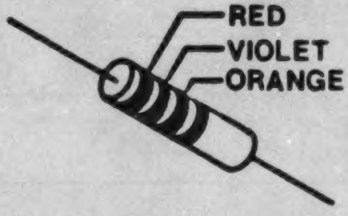
Name: ____________________

Date: ____________________

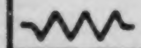
Period: ____________________

INFORMATIONAL HANDOUT

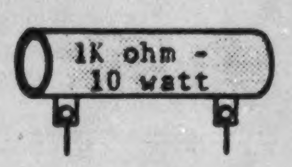
BASIC ELECTRONIC COMPONENTS USED IN PROJECT CONSTRUCTION WITH SCHEMATIC SYMBOL AND LETTER DESIGNATION


RED
VIOLET
ORANGE

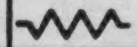
CARBON COMPOSITION RESISTOR

Symbol: 

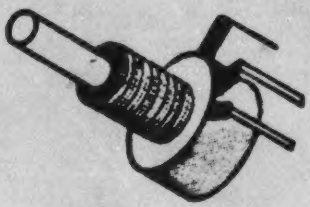
Letter Designation: R


1K ohm -
10 watt

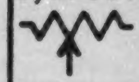
POWER RESISTOR

Symbol: 

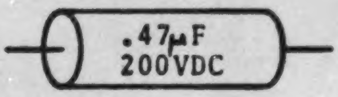
Letter Designation: R



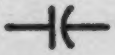
POTENTIOMETER

Symbol: 

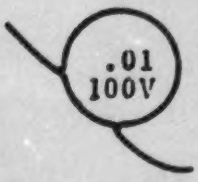
Letter Designation: R


.47µF
200VDC

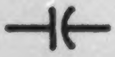
TUBULAR CAPACITOR

Symbol: 

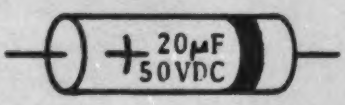
Letter Designation: C



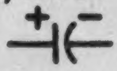
CERAMIC OR DISC CAPACITOR

Symbol: 

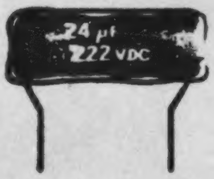
Letter Designation: C



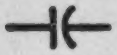
ELECTROLYTIC CAPACITOR

Symbol: 

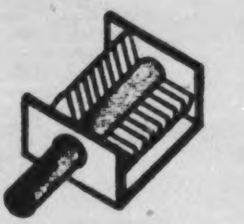
Letter Designation: C


24 µf
222 VDC

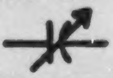
MYLAR CAPACITOR

Symbol: 

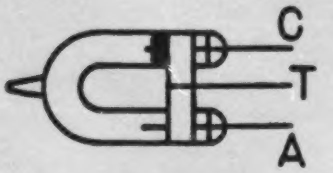
Letter Designation: C



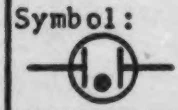
VARIABLE CAPACITOR

Symbol: 

Letter Designation: C



XENON FLASHTUBE

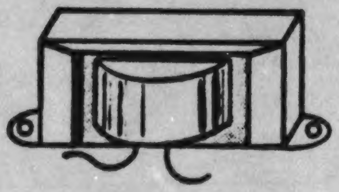
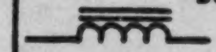
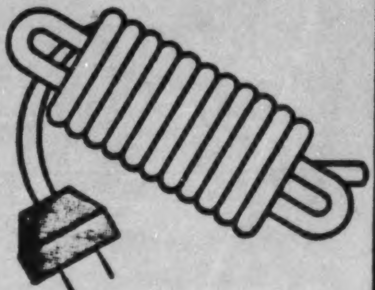
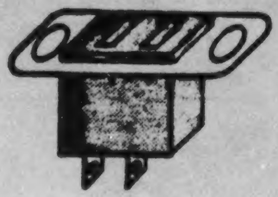
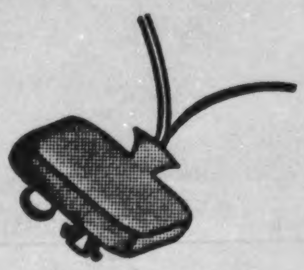
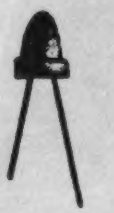
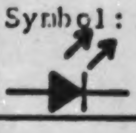
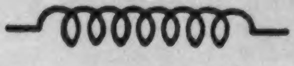
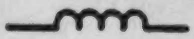
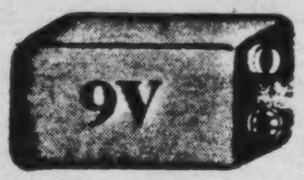
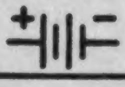
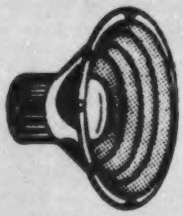
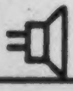
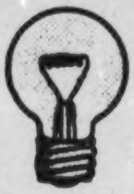
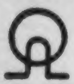
Symbol: 

Letter Designation: LP

Name: ____________________

Date: ____________________

Period: ____________________

 **INDUCTOR (COIL)** Symbol:  Letter Designation: L	 **AC LINE CORD**	 **ELECTRICAL OUTLET**
 **BATTERY CONNECTOR**	 **LIGHT EMITTING DIODE** Symbol:  Letter Designation: D	 **INDUCTOR (COIL)** air core Symbol:  Letter Designation: L
 **BATTERY** Symbol:  Letter Designation: B	 **SPEAKER** Symbol:  Letter Designation: SPKR	 **INCANDESCENT LAMP** Symbol:  Letter Designation: LP

Name: ____________________

Date: ____________________

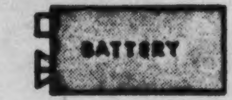
Period: ____________________

INFORMATIONAL HANDOUT

REQUIREMENTS FOR, AND TYPES OF ELECTRICAL CIRCUITS

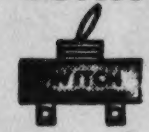
In order to make a working or complete electrical circuit you must have four basic things present in your circuit.

1) The **supply** provides the electrical energy to the circuit.

A 

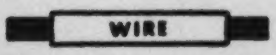
is an example of a supply.

2) The **control** is used to turn the circuit on or off.

A 

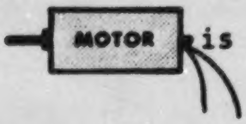
is an example of a control.

3) The **conductor** forms the pathway for the electricity to flow through.

Copper 

is the most common conductor used in electronic projects.

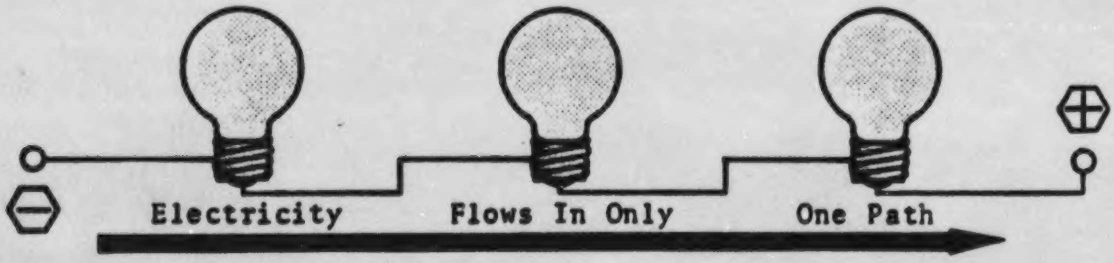
4) The **load** is the device that the circuit will operate.

A 

is an example of a load.

Electric circuits can be built in three basic forms.

1) In a **series circuit**, the parts are connected one after the other. In this type of circuit electricity can move in only one path.

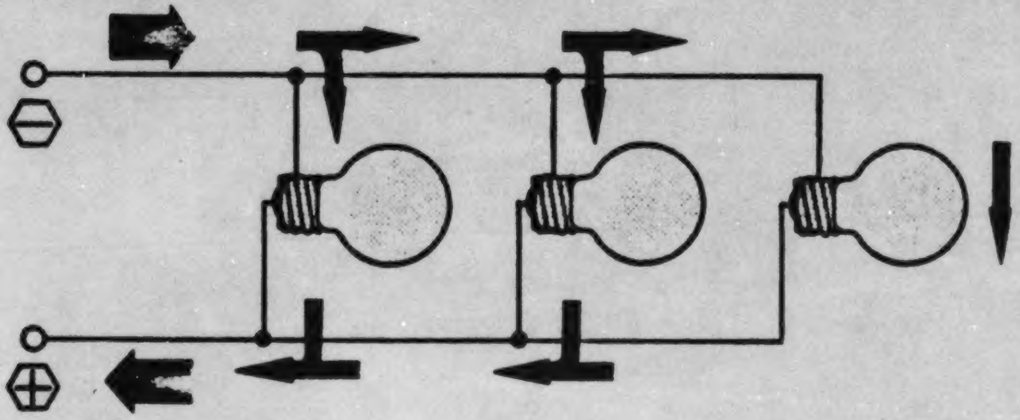


Name: ____________________

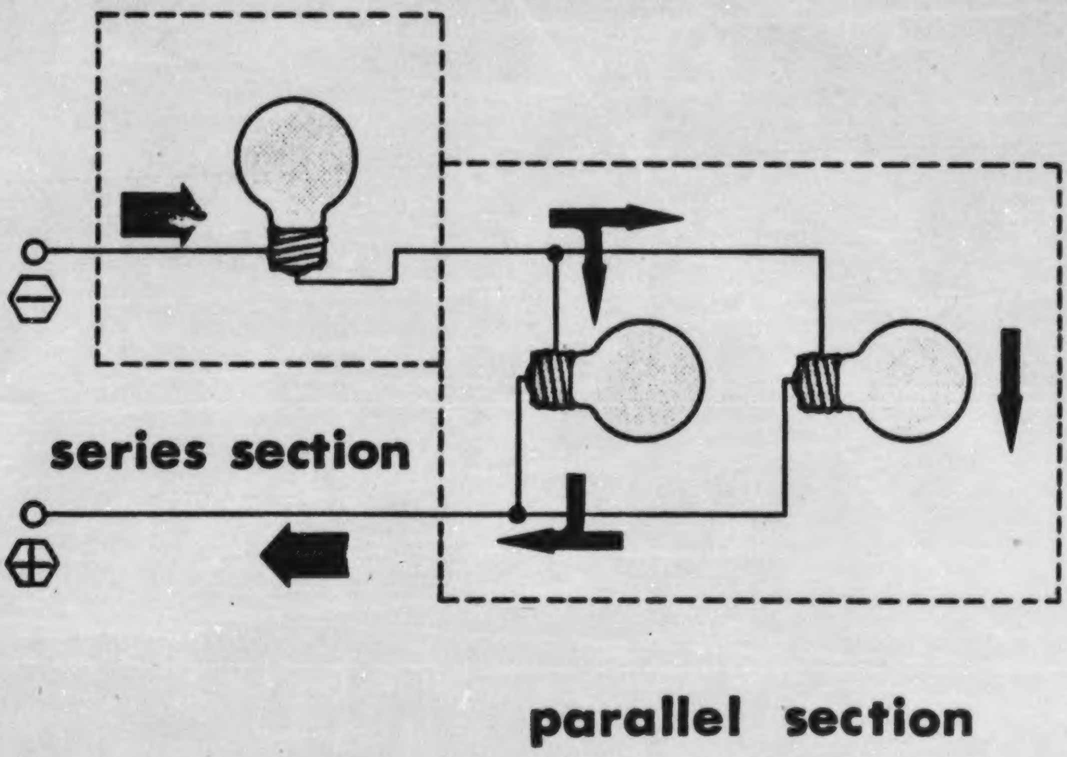
Date: ____________________

Period: ____________________

2) A **parallel circuit** , or branch circuit allows the electricity to "split up" and take different paths through the circuit.



3) A **combination circuit** has at least one series and one parallel circuit contained within it.


series section
parallel section

SCORE:

GRADE:

Name: ______________

Date: ______________

Period: ______________

ANSWER SHEET

EXAM LI-U7

	T A	F B	C	D
1.		■		
2.	■			
3.	■			
4.	■			
5.	■			
6.	■			
7.	■			
8.			■	
9.		■		
10.				■
11.	control			
12.	resistance			
13.	volts			
14.	current			
15.	resistance			
16.	battery			
17.	lamp			
18.	diode			
19.	resistor			
20.	switch			
21.	speaker			
22.	transistor			
23.	capacitor			
24.	lamp			
25.	capacitor			
26.	resistor/ resistance			
27.	battery			
28.	volt			
29.	switch			
30.	ampere			
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99.				
100.				

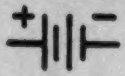
*Show work for problems on back of answer sheet.

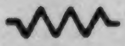
ANSWER KEY
UNIT 7

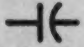
### A. CRYPTICS

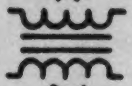
1. ohm
2. current
3. ampere
4. schematic

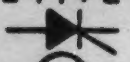
B. ELECTRICAL SYMBOLS AND TERMS

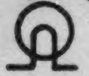
1. 

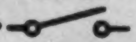
2. 

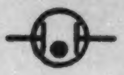
3. 

4. 

5. 

6. 

7. 

8. 

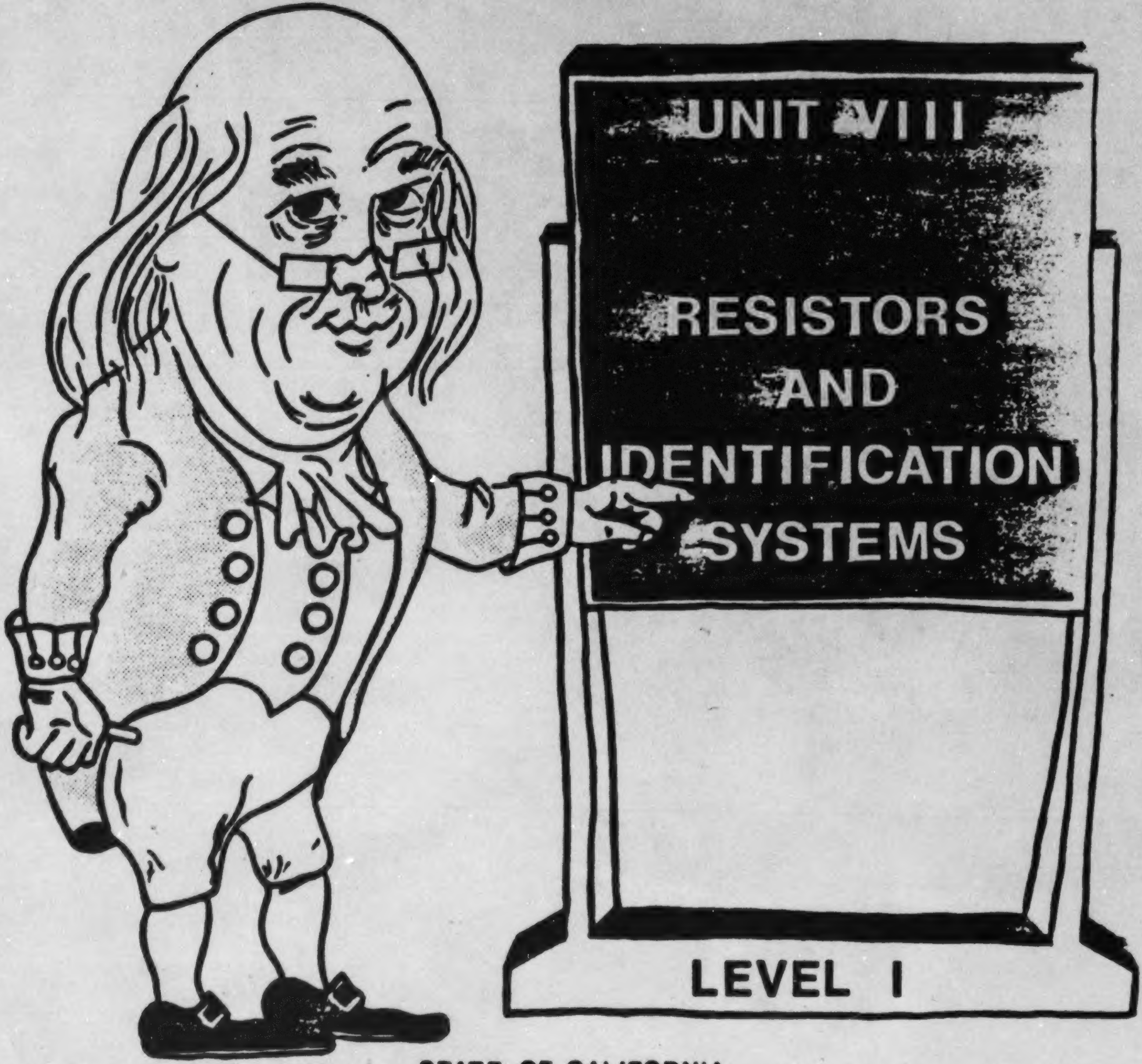
9. diode
10. capacitor (electrolytic)
11. transistor (NPN)
12. N.O. Push Button Switch
13. variable resistor (POT)
14. fixed inductor
15. speaker
16. light emitting diode
17. I
18. Ω
19. C
20. B
21. S
22. D
23. R
24. inductor
25. volt
26. transistor
27. diode/LED
28. ampere
29. voltage
30. switch

C. QUEST ACTIVITY

1. disc. capacitor
2. fixed resistor
3. incandescent lamp
4. silicon controlled rectifier
5. slide switch
6. transformer
7. capacitor
8. variable resistor (POT)
9. transistor
10. toggle switch
11. line cord
12. Push Button Switch

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT VIII
RESISTORS
AND
IDENTIFICATION
SYSTEMS
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME________________________
DATE STARTED________________
DATE COMPLETED______________

BY
R. E. LILLO
N. S. SOFFIOTTO

Title of Unit: Resistors and Identification Systems

Time Allocation: 1 week

Unit Goal:

To develop those student competencies which will enable students to grasp the basic theory and application of resistance, and to familiarize students with the symbols and coding systems that are employed in reference to resistors.

Unit Objectives:

The student will be able to:

1. define the term, symbol, and unit of measurement for resistance.
2. name two common types of resistors and the two coding systems utilized for indicating ohmic values.
3. identify the color coded value of a typical resistor, including the tolerance percentage and mathematically computing the usable tolerance range.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electricity One-Seven. Harry Mileaf, Hayden Book Company, Inc., 1976. Chapter: Electricity Two.

Electronic and Electrical Fundamentals Volume I. Published by C.T.I. Education Products, Inc., 1976. Chapter: 4.

Individual Learning Program In DC Electronics. Heathkit Continuing Education, Heath Company, 1976. Unit: 3.

Overview:

Unit 8 has at its main purpose the expansion of the student's technical competencies so that they will include the means to identify color coded resistors.

First, resistance should be defined as the opposition to current flow, and the instructor should indicate also that all materials contain this quality. The thought that resistance might be a desired factor should be explored as well as the traditionally negative aspect of circuit resistance.

The next topic should express the idea that resistors were developed to provide high resistivity in a small package. Types of resistors along with coding systems, and the concepts of resistor value accuracy (tolerance) should be explored in a variety of exercises.

Note, that some related mathematical skills may have to be reviewed to support tolerance computations.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. Students must be made aware of the fact that resistors are commercially available at electronics stores/dealers in certain sizes only. Indicate that other values are special order devices which will be very expensive to obtain.
2. In this unit the concept or phrase types of resistors will refer to the resistor's internal composition (carbon, wire wound, or film) while the phrase resistor variety is alluding to the physical style (fixed, adjustable, or variable). When presenting this topic display samples of the components that are available in the shop to help students become more familiar with their physical properties.
3. Prior to the class presentation on color code ask students to memorize the complete color code system. Select students individually to recide the colors and the number value.
4. The concept of resistor tolerance and the method of solving specific tolerance ranges are difficult for beginning students to comprehend. Walking the student through some simple problems will improve their understanding and confidence. A review of basic mathematical skills such as percentage determination and decimals can especially assist slower students and is recommended.

Supplemental Activities and Demonstrations:

1. Make a demonstration display that includes a sample of resistor of various types, color code markings, and physical styles. Cement the parts on a board and label.
2. An informative visual aid can be quickly made by using an old cardboard container that has a cylinder shape. Insert a long welding rod through the container and plug the ends. This will act as the body of the resistor with pigtails, now paint the body with one solid color and add various color bands with colored tape.
3. Using a flat piece of cardboard, in the shape of a carbon composition resistor, construct a resistor "mock up" with four see through pockets on one end. Insert different colored paper in each pocket to simulate a coded resistor, then hold the display up so that the class can view and discuss.

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test (keyed)
3. Technical Glossary
4. Worksheet (vocabulary) - Know Your Definitions
5. Worksheet - Resistor Color Coding and Decoding
6. Quest Activity
7. Informational Handout (The Resistor Color Code)
8. Unit Module Answer Keys

VIII. Resistors and Identification Systems

A. Resistors
  1. Types

  2. Symbols

  3. Color code system

  4. Related math computations

B. Project Construction

Test Number _____

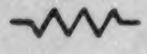
LI-U8

UNIT EXAM

RESISTORS AND IDENTIFICATION SYSTEMS

IMPORTANT-
Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. Carbon composition resistors have their resistance value clearly printed on the body of the device. For example: "1000Ω±10% (T-F)

2. The symbol for a fixed value resistor is:  (T-F)

3. Wirewound resistors are made by wrapping special resistance wire around a ceramic core. (T-F)

4. Orange represents the number "4" in the resistance color code. (T-F)

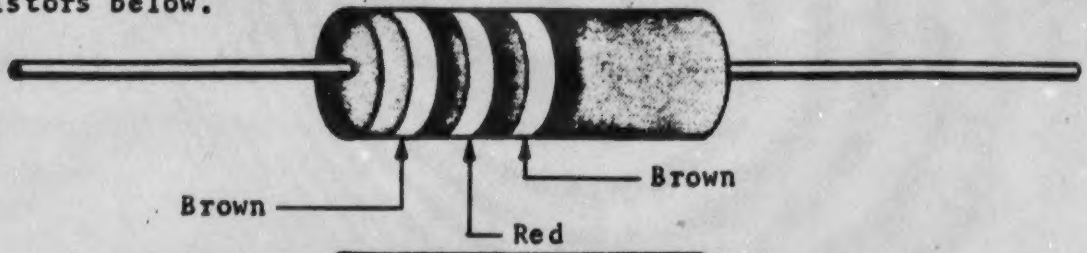
5. If a 100 ohm resistor has a tolerance of 10%, its actual value can be between 90 and 110 ohms. (T-F)

Complete the color code chart below for questions 6 through 14, by filling in the missing number or color.

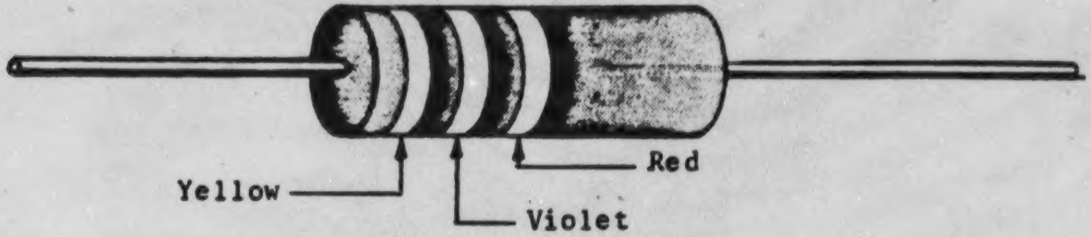
	COLOR		VALUE
	black		0
6.	brown		?
7.	?		2
8.	orange		?
9.	?		4
10.	green		?
11.	blue		?
12.	?		7
13.	?		8
14.	white		?

For questions 15 through 17 find the ohmic values of the color coded resistors below.

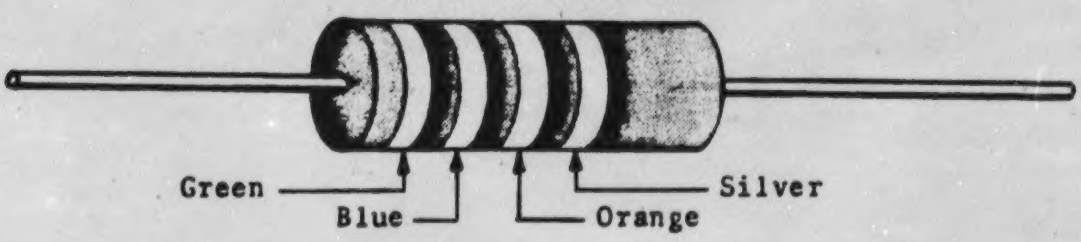
15.


Brown
Brown
Red

16.


Red
Yellow
Violet

17.


Green
Silver
Blue
Orange

For questions 18 through 20 color code the following resistor value:

2700 Ω ± 20%

18. First color band ________

19. Second color band ________

20. Third color band ________

Name: ____________

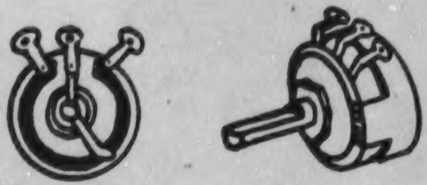
Date: ____________

Period: ____________

TECHNICAL GLOSSARY

CARBON COMPOSITION RESISTOR:	The most common type of resistor used in electronic devices. It contains carbon as the resistance material, and uses color bands to indicate its ohmic value.
COLOR CODE:	The resistor color code uses a system of three or four color bands, painted around the resistor, to give the "ohmic value" of the resistor. Each color in the code represents a number or percentage value.
FIXED VALUE RESISTOR:	A resistor which has only one resistance value. Fixed resistors can be either carbon composition, wirewound, or film type.
OHMIC VALUE:	The ohm rating or value of a resistor.
POTENTIOMETER:	A type of variable resistor consisting of resistance material and a movable arm. A terminal is attached to each end of the resistance material and to the movable arm. The resistance can be set by adjusting the movable arm.

POT



RESISTOR:	An electrical component used to oppose the flow of electricity through a circuit. Resistor values are measured in the basic unit ohms. Symbol: —\/\/\/— Letter symbol: R.
TOLERANCE:	The amount by which the actual value of a resistor may vary from its marked value and still be considered good. Tolerances are usually expressed as a percentage. For example, the value of a 1000Ω resistor with a 10% tolerance can vary between 900Ω and 1100Ω.
WATTAGE RATING:	A measurement of the amount of power that a resistor can safely handle. Generally, the larger in size the resistor is the more power it can handle. Excessive power will cause a resistor to overheat and burn-up.

R = Resistance in Ω's

SCORE:

GRADE:

Name: ________________

Date: ________________

Period: ________________

WORKSHEET

VOCABULARY - KNOW YOUR DEFINITIONS

Develop a short definition, using your own words, for the following terms. A sketch should be included with your definition when appropriate.

1. COLOR CODE:

2. POTENTIOMETER:

3. RESISTOR:

4. OHMIC VALUE:

5. CARBON COMPOSITION RESISTOR:

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

RESISTOR COLOR CODING AND DECODING

Determine the resistance value of the following color coded resistors.

EXAMPLE:

First Band	Second Band	Third Band	Fourth Band	
yellow 4	violet 7	brown 0	silver ±10%	A. 470Ω ±10%

	First Band	Second Band	Third Band	Fourth Band	
1.	Brown ___	Red ___	Brown ___	None ___	1. ☐
2.	Yellow ___	Violet ___	Orange ___	Silver ___	2. ☐
3.	Orange ___	White ___	Red ___	Gold ___	3. ☐
4.	Blue ___	Gray ___	Black ___	None ___	4. ☐
5.	Green ___	Blue ___	Yellow ___	Gold ___	5. ☐
6.	Brown ___	Black ___	Red ___	Silver ___	6. ☐
7.	Gray ___	Red ___	Orange ___	Silver ___	7. ☐
8.	Brown ___	Gray ___	Green ___	None ___	8. ☐

Name: ____________________

Date: ____________________

Period: ____________________

Complete the color coding of the following resistors by using the system shown below. This system can be used when converting a "number value" into a color code equal.

3 9 0 0 Ω ±5%

First Band (orange)

Second Band (white)

Third Band "number of zeros" (red)

Fourth Band "tolerance" (gold)

EXAMPLE:

		1st Band	2nd Band	3rd Band	4th Band		
B.	120Ω±10%	Brown	______	Brown	Silver	B.	RED
9.	3300Ω±5%	Orange	Orange	______	Gold	9.	
10.	47Ω±20%	______	Violet	Black	None	10.	
11.	680Ω±10%	Blue	______	Brown	Silver	11.	
12.	56000Ω±10%	______	Blue	Orange	Silver	12.	
13.	120000Ω±5%	Brown	Red	______	Gold	13.	
14.	2500Ω±20%	Red	(A)______	(B)______	None	14A.	
						14B.	

EXTRA CHALLENGE: Try this one:

15.	820Ω±5%	(A)______	(B)______	(C)______	(D)______	15A.	
						15B.	
						15C.	
						15D.	

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

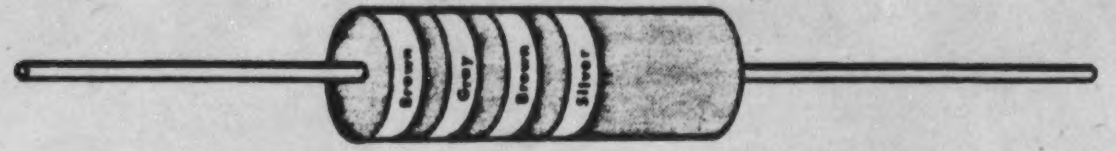
QUEST ACTIVITY

"UNIT 8"

In this activity you will be color coding resistors for an assigned value and computing their tolerance ranges. Cut out the puppets on the attached sheet and use them as the color bands for the blank resistors drawn below. Use colored pencils to shade in each puppet.

EXAMPLE:

A. Color code a 180Ω±10% resistor and determine its tolerance range.

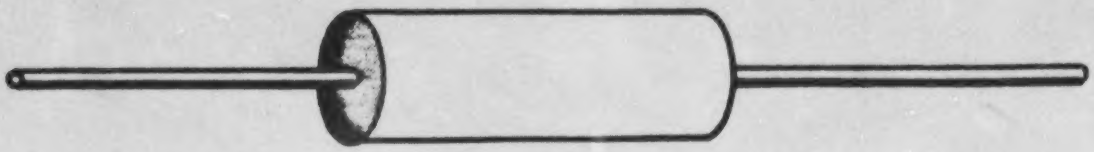


Tolerance range: From 198Ω to 162Ω

Show work:

percentage	upper limit	lower limit
180	180	180
x .10	+ 18	- 18
000		
180	198	162
18.00		

1. Color code a 100Ω±20% resistor and determine its tolerance range.



Tolerance range: From ____ to ____

Show work:

percentage	upper limit	lower limit

Name: ____________________

Date: ____________________

Period: ____________________

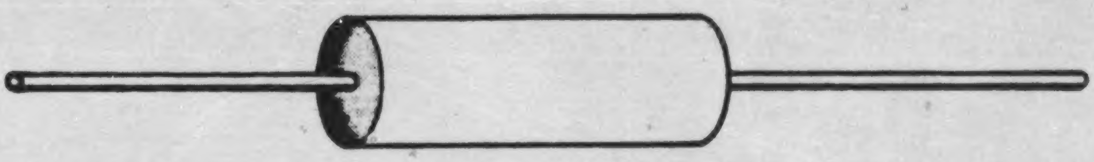
2. Color code a 2000Ω±10% resistor and determine its tolerance range.

Tolerance range: From _____ to _____

Show work:

percentage	upper limit	lower limit

3. Color code a 15000Ω±10% resistor and determine its tolerance range.

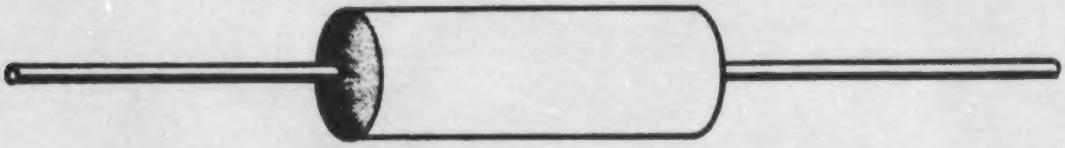


Tolerance range: From _____ to _____

Show work:

percentage	upper limit	lower limit

4. Color code a 560Ω±5% resistor and determine its tolerance range.



Tolerance range: From _____ to _____

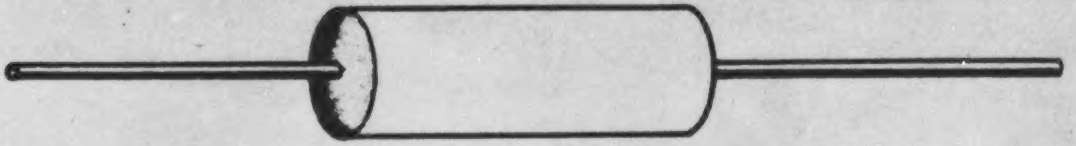
Show work:

percentage	upper limit	lower limit

SPECIAL QUEST:

5. Have your teacher assign you an individual resistance value. Color code that resistor and compute its tolerance range.

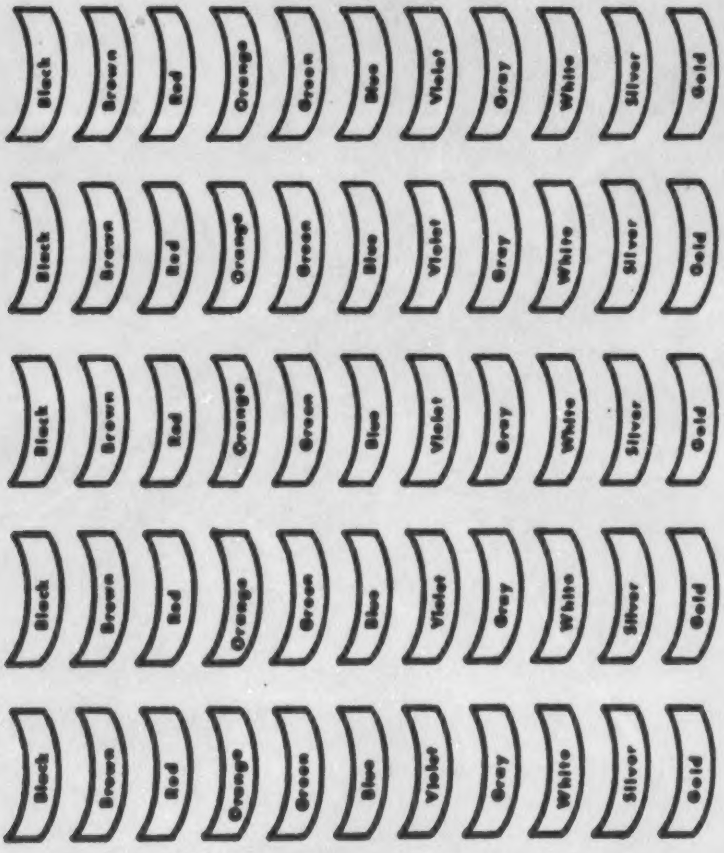
Resistance value: ____________________



Show work: Tolerance range: From _____ to _____

percentage	upper limit	lower limit

CUT


Black
Brown
Red
Orange
Green
Blue
Violet
Gray
White
Silver
Gold
Black
Brown
Red
Orange
Green
Blue
Violet
Gray
White
Silver
Gold
Black
Brown
Red
Orange
Green
Blue
Violet
Gray
White
Silver
Gold
Black
Brown
Red
Orange
Green
Blue
Violet
Gray
White
Silver
Gold
Black
Brown
Red
Orange
Green
Blue
Violet
Gray
White
Silver
Gold

Name: ______________

Date: ______________

Period: ______________

INFORMATIONAL HANDOUT

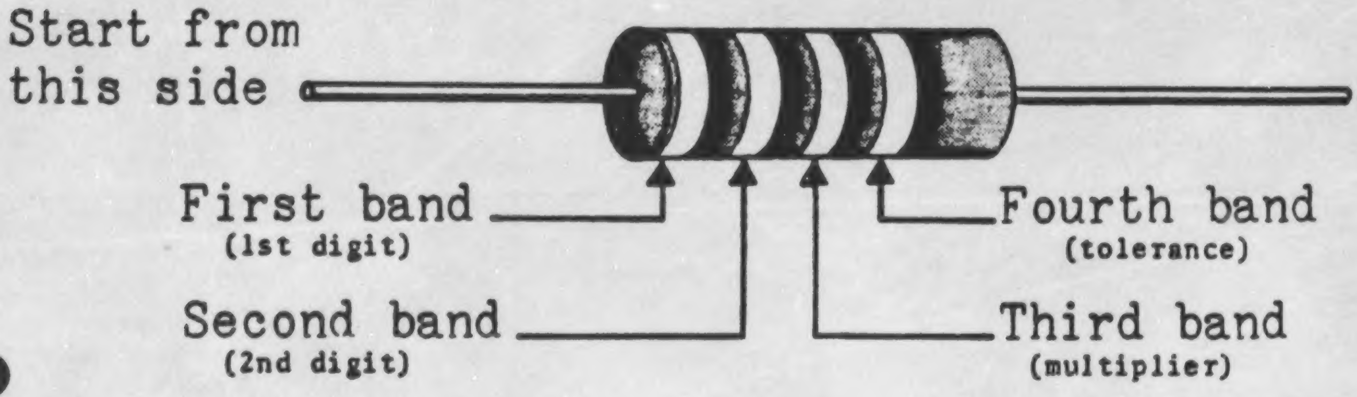
THE RESISTOR COLOR CODE

Carbon composition resistors use a system of three or four color bands painted on the body of the resistor to give its ohmic value. Each color represents a number or percentage value. Here's how the system works.

Color Code Chart:

	First Color Band	Second Color Band	Third Color Band	Fourth Color Band
Color Code	First Digit	Second Digit	Number of Zeros to Add	Tolerance
0 Black		0	0	No color 20%
1 Brown	1	1	1	Silver 10%
2 Red	2	2	2	Gold 5%
3 Orange	3	3	3	
4 Yellow	4	4	4	
5 Green	5	5	5	
6 Blue	6	6	6	
7 Violet	7	7	7	
8 Gray	8	8		
9 White	9	9		
- Gold	-	-	÷ 10	
- Silver	-	-	÷ 100	

Locating The Color Bands


Start from this side
First band
(1st digit)
Second band
(2nd digit)
Fourth band
(tolerance)
Third band
(multiplier)

Name: ____________________

Date: ____________________

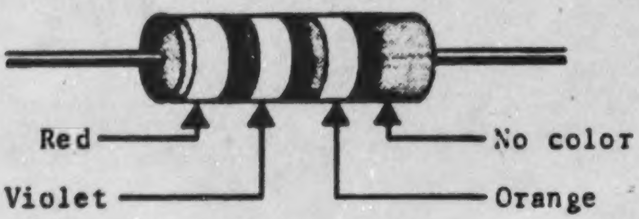
Period: ____________________

Using The Color Code:

Even though it looks a little difficult, using the color code system is actually pretty easy once you have the hang of it. These are the points to remember!!!

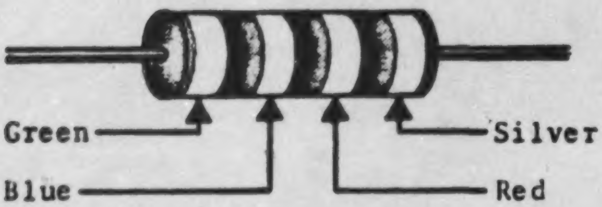
1. The first color band represents the first digit.
2. The second color band represents the second digit.
3. The third color band basically tells how many zeros are added to the first two digits.
4. The fourth color band indicates the ± tolerance.

EXAMPLE:



Red = 2
Violet = 7
Orange = (3)000
No color = ±20%

Total Value 27000Ω ±20%



Green = 5
Blue = 6
Red = (2)00
Silver = ±10%

Total Value 5600Ω ±10%

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM LI-U8

	T A	F B	C	D		T A	F B	C	D		T A	F B	C	D		T A	F B	C	D
1.		■			26.					51.					76.				
2.	■				27.					52.					77.				
3.	■				28.					53.					78.				
4.		■			29.					54.					79.				
5.	■				30.					55.					80.				
6.	1				31.					56.					81.				
7.	red				32.					57.					82.				
8.	3				33.					58.					83.				
9.	yellow				34.					59.					84.				
10.	5				35.					60.					85.				
11.	6				36.					61.					86.				
12.	violet				37.					62.					87.				
13.	grey				38.					63.					88.				
14.	9				39.					64.					89.				
15.	120Ω				40.					65.					90.				
16.	4700Ω				41.					66.					91.				
17.	56000Ω ±10%				42.					67.					92.				
18.	red				43.					68.					93.				
19.	violet				44.					69.					94.				
20.	red				45.					70.					95.				
21.					46.					71.					96.				
22.					47.					72.					97.				
23.					48.					73.					98.				
24.					49.					74.					99.				
25.					50.					75.					100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT 8

A. KNOW YOUR DEFINITIONS

1. (subjective answer)
2. (subjective answer)
3. (subjective answer)
4. (subjective answer)
5. (subjective answer)

B. RESISTOR COLOR CODING AND DECODING

1. 120Ω ±20%
2. 47000Ω ±10%
3. 3900Ω ±5%
4. 68Ω ±20%
5. 56000Ω ±5%
6. 1000Ω ±10%
7. 82000Ω ±20%
8. 1800000Ω ±20%
9. red
10. yellow
11. gray
12. green
13. yellow

14A. green
14B. red

Extra challenge

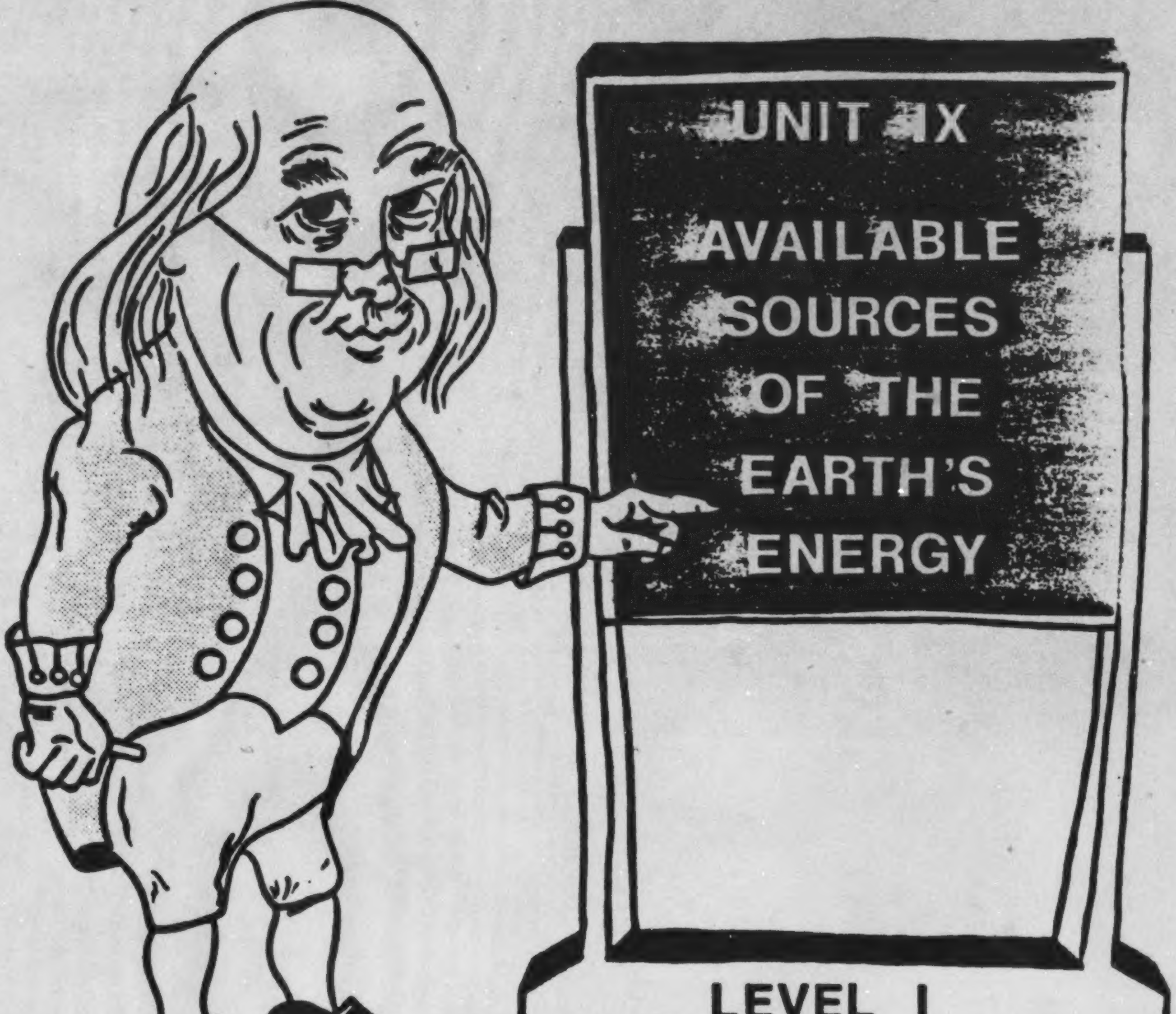
15A. gray
15B. red
15C. brown
15D. gold

C. QUEST ACTIVITY

1. brown, black, brown
   80Ω - 120Ω
2. red, brown, red, silver
   1800Ω - 2200Ω
3. brown, green, orange, silver
   13500Ω - 16500Ω
4. green, blue, brown, gold
   532Ω - 588Ω
5. (subjective answer)

ELECTRICITY / ELECTRONICS

CURRICULUM GUIDE
INSTRUCTIONAL MODULE


UNIT IX
AVAILABLE SOURCES OF THE EARTH'S ENERGY
LEVEL I

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION

NAME____________________

DATE STARTED____________

DATE COMPLETED_________

BY
R. E. LILLO
N. S. SOFFIOTTO

STATE ELECTRICITY/ELECTRONICS CURRICULUM GUIDE
INSTRUCTOR'S GUIDE TO ACCOMPANY LEVEL I UNIT #9

Title of Unit: Available Sources of the Earth's Energy

Time Allocation: 1 week

Unit Goal:

To impart basic knowledge and competencies related to the methods of producing or generating large amounts of electricity, and to assess which methods are presently more commercially feasible.

Unit Objectives:

The student will be able to:

1. identify the four major sources of the Earth's energy (geothermal, fossil fuels, nuclear, and water), and briefly describe their methods of producing power.
2. state several alternative methods for the generation of electricity which are currently being explored.
3. summarize and discuss the need for conservation in the use or consumption of electrical energy.

Evaluation:

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which utilizes a combination of written, oral, and laboratory testing procedures.

Instructor References:

Electricity and Electronics Basic. William B. Steinberg and Walter B. Ford, American Technical Society, 1972. Unit: 16.

Energy Primer. Richard Merrill and Thomas Gage, Dell Publishing Co., 1978. All.

Industrial Electricity. Rex Miller, Chas. A. Bennett Co., 1978. Chapter: 2.

Overview:

Unit 10 like part of Unit 3 focuses on the fact that electricity has become an essential part of our life, therefore it is important to be aware of the specific methods for producing electrical power in large quantities.

The instructor should first examine the four major or primary sources of the Earth's energy. The examination of these sources, of course, is of a very general nature, but should include the future availibility of power plant fuels and the basic history of plant development.

Next, explain that present demand for power may soon be greater than the supply, and to help offset this condition alternative resources and power plants are being considered, along with general conservation of existing supplies.

Finally, awareness that the new sources will take time to be fully developed and implemented should be brought out through a class discussion.

Suggested Presentation Hints/Methodology:

Follow the instructional module unit outline as a basic skeleton for curriculum presentation, however, note the following:

1. Try not to leave the impression that the major methods of producing energy presented in this unit are the only methods; they are just the most common ones. Explain further that other methods have potential, yet, are still in the experimental stage in terms of development.
2. When discussing nuclear power plants present some information related to potential health hazards from radioactive by products. Indicate that strontium, cesium, plutonium and tritium can pose some real problems to human beings.
3. Although energy demand growth has been slowed recently by higher prices and conservation, total energy consumption is still expected to increase about 50% by 1990 - discuss the implication of this one statistic.
4. Note: Fission - involves the splitting of the nucleas of atoms such as uranium. Fission - involves joining the nuclei of two light atoms such as deuterium and tritium. Remember to explain that in both cases the nuclear reaction produces energy!
5. Introduce new career choices to your class which may exist in the future in such special energy areas as solar, geothermal, wind, and nuclear power.

Supplemental Activities and Demonstrations:

1. Write or telephone your local gas and electric company for information related to the generation of power. Many companies produce free materials that can be distributed to students that will really enhance their knowledge about plant operation and purpose.
2. Mickey Mouse and Goofy Explore Energy is a book in comic form which does an outstanding job in relating current energy information to students. For information about this comic book, write to:

Public Affairs Department
Exxon, U.S.A.
P.O. Box 2180
Houston, Texas 77001

Instructional Module Contents:

1. Unit Outline (overhead)
2. Pre-Post Test Keyed
3. Technical Glossary
4. Worksheet (vocabulary) - Scrambled Word Puzzle
5. Quest Activities
6. Informational Handout (Sources of Energy)
7. Unit Module Answer Keys

X. Available Sources of the Earth's Energy

A. Geothermal

B. Fossil Fuels
  1. Natural gas

  2. Crude oil

  3. Coal

C. Nuclear

D. Water

E. Other
  1. Tidal

  2. Wind

  3. Solar

  4. Methane and bio-gas

  5. Muscle power

F. Project Construction

Test Number _____

LI-U9

UNIT EXAM

AVAILABLE SOURCES OF THE EARTH'S ENERGY

IMPORTANT-

Indicate your responses on the answer sheet only. Fill in the box corresponding to the correct answer to each question - there is only one correct answer for each question.

1. Of the many sources of energy available, fossil fuel is the most widely used. (T-F)

2. Fortunately, the earth has a large supply of usable energy so we need not conserve. (T-F)

3. Most power plants use steam from heated water to turn a turbine-generator. (T-F)

4. Geothermal energy comes from the constant wave and tidal action of the ocean. (T-F)

5. Solar energy supplies both heat and light which can be put to work making electricity or heating liquids. (T-F)

MATCHING

Record the letter of the answer which best matches the numbered term.

6. Fossil fuel
7. Geothermal power
8. Hydro power
9. Tidal power
10. Solar power
11. Conservation
12. Nuclear power

E. The force produced by the wave action of the ocean.
F. The heat produced by atomic fission.
G. Coal, petroleum, natural gas.
H. Saving or limiting the use of a resource.
I. Geysers or natural steam.
J. Windmills or wind generators.
K. Energy provided by running or falling water.
L. Heat and light provided by the sun.

Name: ____________________

Date: ____________________

Period: ____________________

TECHNICAL GLOSSARY

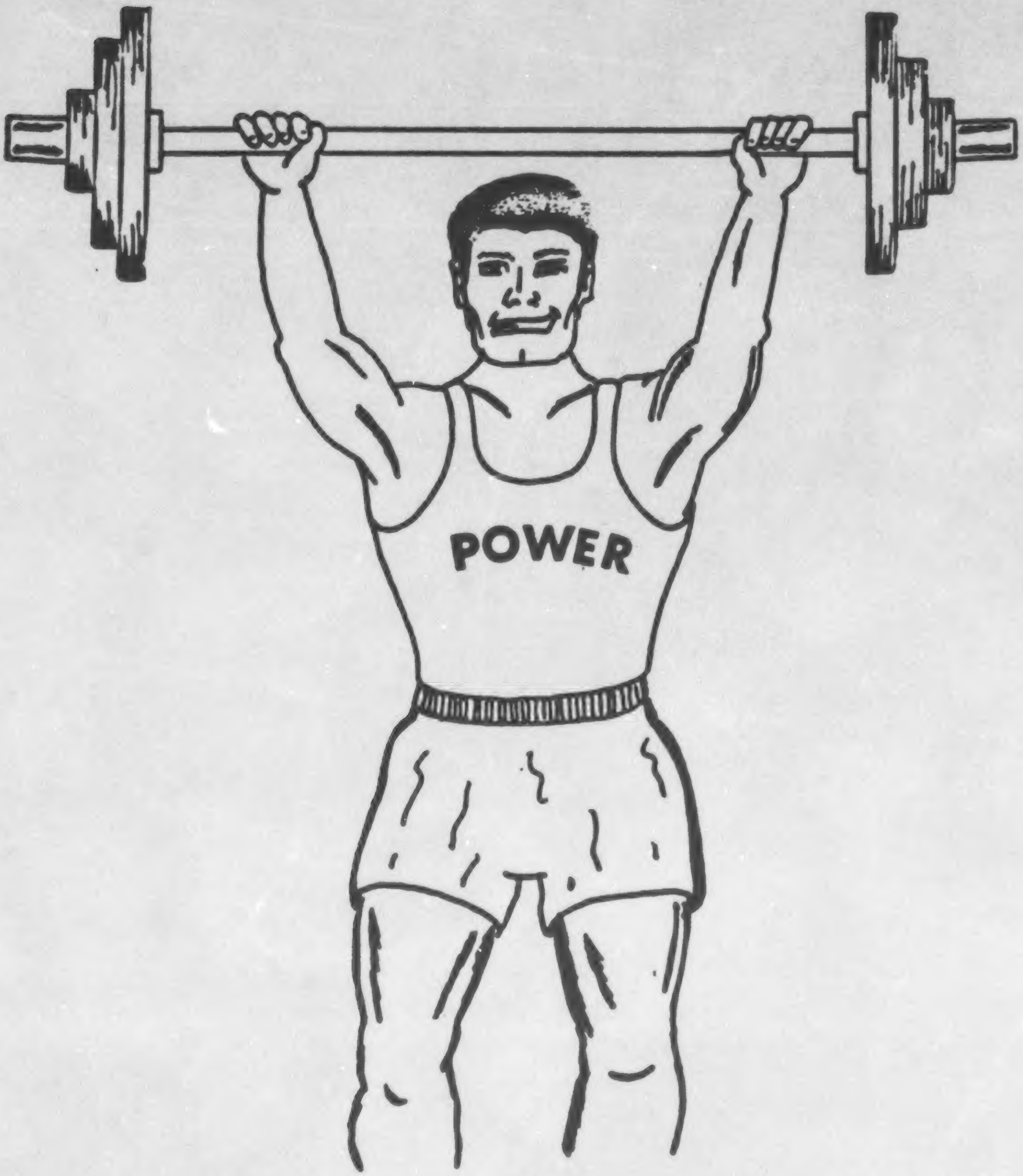
BIO-GAS	An interesting source of energy which has become more popular as an inexpensive fuel. Bio-gas or methane is formed when garbage or natural wastes deteriorate and breakdown. This gas can be trapped and used as a substitute for natural gas.
COAL:	A hard black fossil fuel, made mostly of carbon, which can be burned to produce heat. Coal has the disadvantage that it gives off a sooty or black smoke when burned.
CONSERVATION:	The process of saving or limiting the use of a resource, such as fossil fuels, electrical energy, etc.
CRUDE OIL:	Often called petroleum, this material is a dark, thick and slippery liquid type fossil fuel. Crude oil is refined to produce more usable fuels such as heating oil, diesel fuel, gasoline, etc.
FOSSIL FUEL:	Fuels such as coal, crude oil, natural gas, and refined petroleum products (gasoline, diesel oil, and fuel oil) which are burned in order to produce heat.
GEOTHERMAL ENERGY:	A source of energy produced when water seeps into the ground, is heated by the Earth's hot magma core, and then rises to the surface as steam. Geysers, steam vents, and fumaroles are examples of geothermal activity.
MUSCLE POWER:	The oldest form of power, in which human muscles or an animals muscles are used to do work.
NATURAL GAS:	A type of fossil fuel which is in the form of a vapor or gas. Natural gas is usually found along with petroleum or crude oil. The gas cannot be seen, but it does have an odor. When burned, it makes a clean, hot fire.
NUCLEAR ENERGY:	A modern source of energy which uses the atomic principles of fission (the breaking of the atom) to produce tremendous amounts of heat. Nuclear energy is safe if handled properly. Just one pound of nuclear fuel (uranium) has as much energy as 3,000 tons of coal.
SOLAR ENERGY:	The clean, nonpolluting energy available from the sun or the sunbeam. Modern developments in solar energy have lead to more efficient solar collectors and heating units.
TIDAL POWER:	The energy available from the constant tide or wave action of the ocean.

Name: ____________________

Date: ____________________

Period: ____________________

WATER POWER:	The energy provided by running or falling water. Water power is also referred to as hydro energy.
WIND POWER:	Using the force of the wind to supply power for such jobs as turning a windmill or turbine.



SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

WORKSHEET

VOCABULARY - SCRAMBLED WORD PUZZLE

Unscramble the letters below to uncover the electronic terms.

EXAMPLE:

A.	GERYEN	A.	ENERGY
1.	AOLC	1.	
2.	SOSLIF EFLU	2.	
3.	DUREC ILO	3.	
4.	AOLRS NEEGRY	4.	
5.	IADLT EORPW	5.	
6.	TAANLUR AGS	6.	
7.	NOSERATVONCI	7.	
8.	THEMGOREAL GNEEYR	8.	
9.	RATWE WOPER	9.	
10.	CLEARNU ERGENY	10.	
11.	CLUESM ERPOW	11.	
12.	LOPTREEMU	12.	

SCORE:

GRADE:

Name: ______________________

Date: ______________________

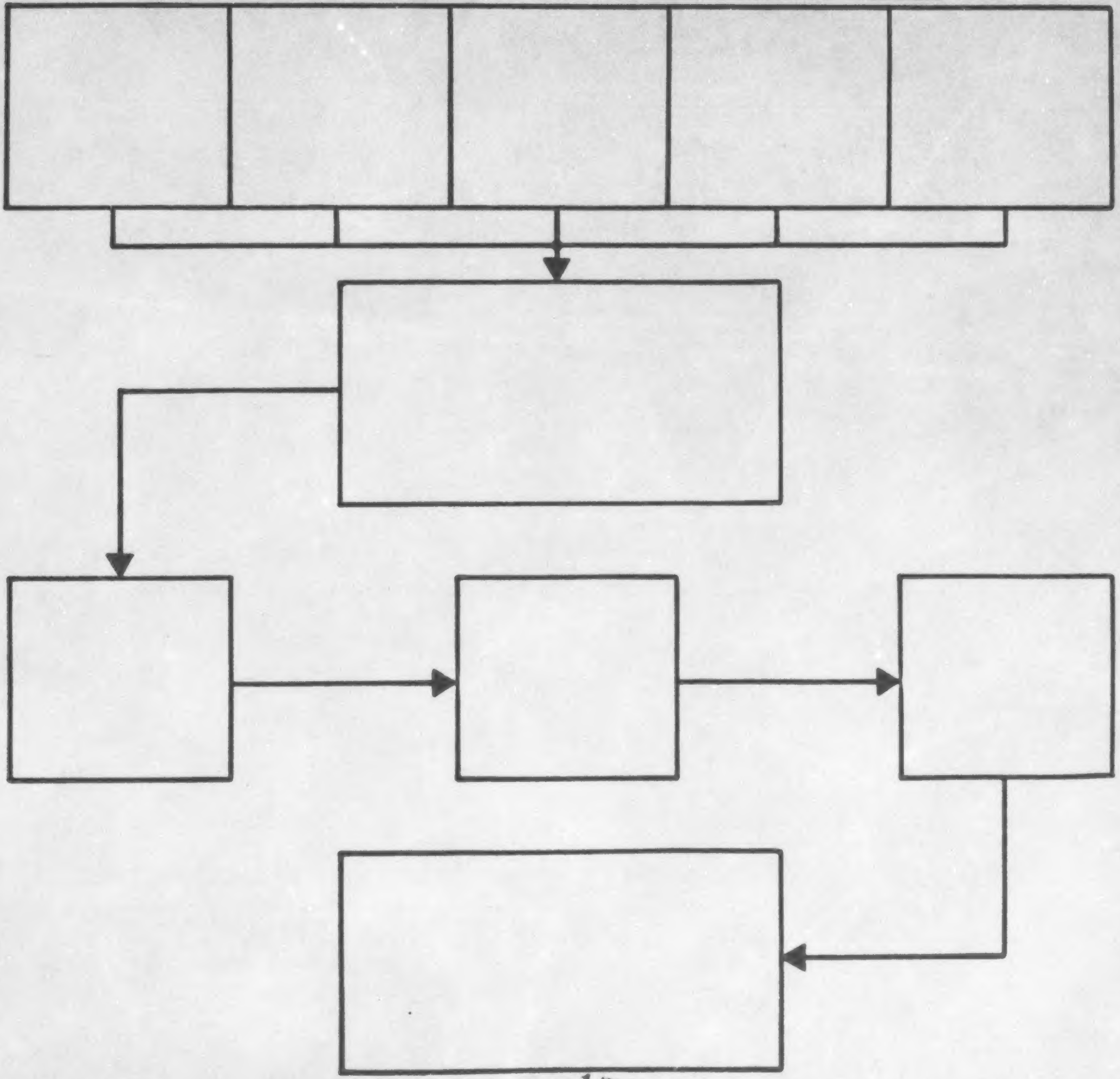
Period: ______________________

WORKSHEET

QUEST ACTIVITY

"UNIT 9"

To generate and distribute the electricity used in our homes and businesses, power companys must follow a process that has a number of steps. Below you will find a set of boxes arranged in order or sequence from start to end. Your task will be to arrange the puppets, found on page two, in proper order to show steps used in making electricity. You can use colored pencils to shade in the puppets and to make your work look sharp.

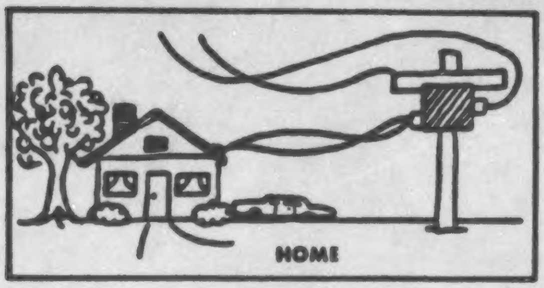


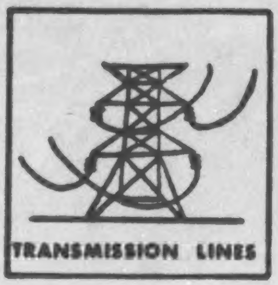
Name: ______________________

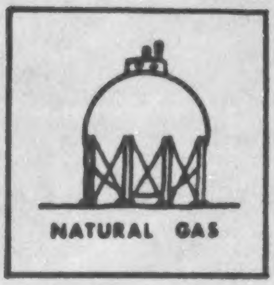
Date: ______________________

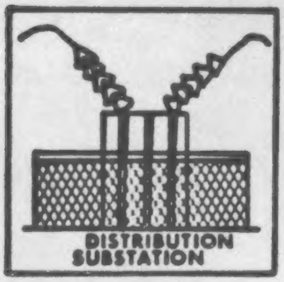
Period: ______________________

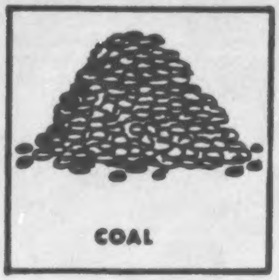
PUPPETS

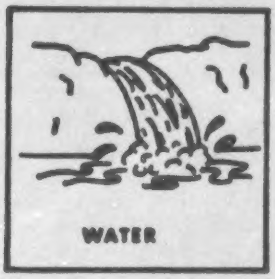

HOME

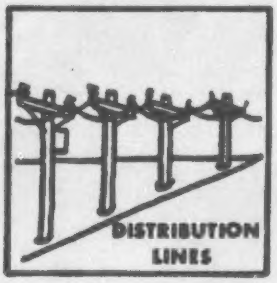

TRANSMISSION LINES

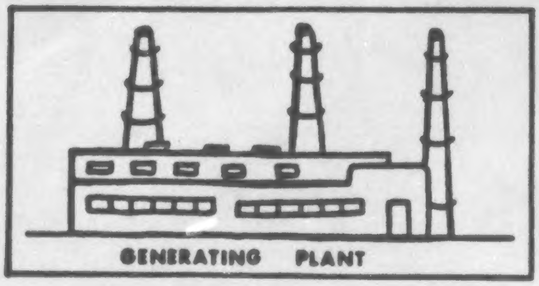

NATURAL GAS

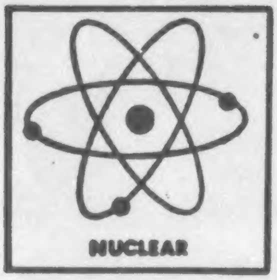

DISTRIBUTION SUBSTATION

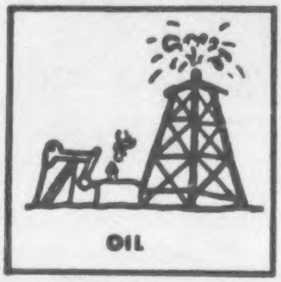

COAL


WATER


DISTRIBUTION LINES


GENERATING PLANT


NUCLEAR


OIL

Name: ____________________

Date: ____________________

Period: ____________________

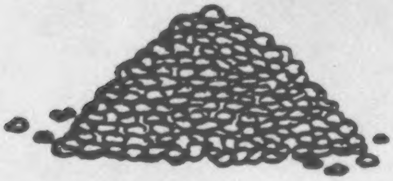
INFORMATIONAL HANDOUT
SOURCES OF ENERGY

GEOTHERMAL

OLD FAITHFUL

The energy available from geysers or natural steam vents can be harnessed to do work such as turning a turbine. California has the worlds largest geothermal generating plant, which uses 200 wells that bring up natural steam from as far as 10,000 feet below the earths surface to turn 12 turbine generators.

FOSSIL FUELS



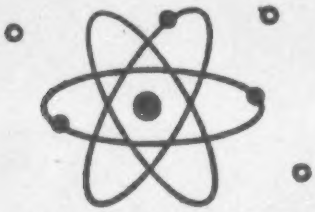
COAL

CRUDE OIL

NATURAL GAS

The burning of fossil fuels to release energy is today the largest single source of natural energy. Fossil fuels are formed from decayed remains of ancient animals and plants. These remains have been squeezed and formed by the earth's pressures for many thousands of years to form coal, crude oil, and natural gas. These materials must be mined and carefully removed from the earth. Fossil fuels are then burned to release heat which is used to heat water and make steam. The steam is then used to turn a turbine - generator.

NUCLEAR



Atomic reactors, which can release the vast amounts of energy trapped within the small atom, can be used as a relatively safe form of energy. As atoms are split in a process called fission, high heats are generated. This heat is used to heat water and produce steam. The steam is then used to turn a turbine - generator.

WATER- HYDRO

The force produced by falling or running water can be harnessed and used to turn a turbine. Water power or hydro energy is an old source of natural power; water wheels were commonly used to operate

Name: ____________________

Date: ____________________

Period: ____________________

factories and machinery. Several states, especially California, count heavily on water power to generate electricity.

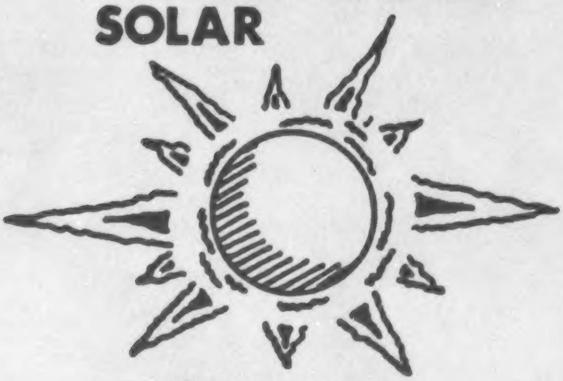
TIDAL

The constant wave and tide action of the ocean is being studied as a future source of energy. Special wave action generators have been designed to produce electricity using tidal power.

WIND

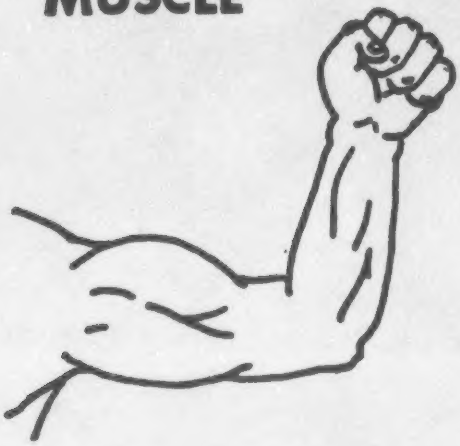
Wind energy may some day become an important and practical source of energy. Today wind energy can be used to turn blades such as on a windmill.

SOLAR



The light and heat produced by the sun can be used in several ways to provide energy. One system which is becoming very popular is solar heating, where sun rays are gathered and used to heat water for home and pool heating. The suns light energy can be focused on solar cells to produce electricity. By some forecasts, in the year 2020 solar energy will make an important contribution to our energy supply.

MUSCLE



The oldest form of energy where human or animal muscles are used to do work. The ancient civilizations used muscle power exclusively to accomplish such fantastic things as the pyramids of Egypt, the Acropolis in Greece, and the Colosseum of Rome.

SCORE:

GRADE:

Name: ____________________

Date: ____________________

Period: ____________________

ANSWER SHEET

EXAM LI-U9

	T	F				T	F				T	F				T	F		
	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1.	■				26.					51.					76.				
2.		■			27.					52.					77.				
3.	■				28.					53.					78.				
4.		■			29.					54.					79.				
5.	■				30.					55.					80.				
6.	G				31.					56.					81.				
7.	I				32.					57.					82.				
8.	K				33.					58.					83.				
9.	E				34.					59.					84.				
10.	L				35.					60.					85.				
11.	H				36.					61.					86.				
12.	F				37.					62.					87.				
13.					38.					63.					88.				
14.					39.					64.					89.				
15.					40.					65.					90.				
16.					41.					66.					91.				
17.					42.					67.					92.				
18.					43.					68.					93.				
19.					44.					69.					94.				
20.					45.					70.					95.				
21.					46.					71.					96.				
22.					47.					72.					97.				
23.					48.					73.					98.				
24.					49.					74.					99.				
25.					50.					75.					100.				

*Show work for problems on back of answer sheet.

ANSWER KEY
UNIT-9

A. SCRAMBLED WORD PUZZLE

1. coal
2. fossil fuel
3. crude oil
4. solar energy
5. tidal power
6. natural gas
7. conservation
8. geothermal energy
9. water power
10. nuclear energy
11. muscle power
12. petroleum

B. QUEST ACTIVITY

(subjective evaluation)

FINAL REPORT

ELECTRICITY/ELECTRONICS CURRICULUM GUIDE - PHASE II

(Instructional Modules for Levels I, II, III)

EAST SIDE UNION HIGH SCHOOL DISTRICT
Keith Bush, Project Director

Project Number 43-69427-3-8-244
Project Approval Dates: January, 1978 - June 30, 1979

"The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

APPENDIX GUIDE

A-------------------Level I Instructional Modules
(9-week and 18-week)

B-------------------Level II Instructional Module

C------------------Level III Instructional Module

D------------------Evaluations from Regional Inservices

E------------------Information Brochure - Regional Inservices

F------------------Agenda - Regional Inservices

G------------------Requests from Regional Inservices

H------------------Special Interest Groups - Industrial Education

FINAL REPORT
PROJECT NUMBER 43-69427-3-8-244

REVIEW OF ACTIVITIES CONDUCTED DURING THE PROJECT

The project was conducted under the direction of the East Side Union High School District, Frank Fiscalini, Superintendent, with aid and assistance of the Bureau of Industrial Education. District personnel directly responsible for completion of the project were:

1. Career Services Administrator - Clarence Moomau
2. Industrial Education - Keith Bush, Project Director
3. Robert Lillo, Project Coordinator
4. Nick Soffiotto, Project Staff Leader.

All budgetary matters were conducted through the District's business office, using standard district and state procedures.

The Project Director made the necessary arrangements for running the project, which included:

1. Budgeting
2. Personnel hiring - every attempt was made to maintain an ethnic and sex balance commensurate with the district
3. Contracts for consultants
4. Procurement of supplies and materials
5. The project office and resource library used in Phase I, of State Curriculum Guide for Electricity/Electronics was utilized.

Learning Module Development: (Activities for Objective 3.1)

1. The project staff reviewed task and/or competencies established in Phase I of the State Curriculum Guide for Electricity/Electronics
2. Reviewed technical literature
3. Analyzed school district questionnaires completed during Phase I. Related input which aided in the establishment of the criteria for learning module content and scope.
4. Developed individual worksheet models for each section of learning modules.

Learning Module Development: (Activities for Objectives 3.2, 3.3, 3.4)*

5. Consulted with specialists in the areas of reading, special education, sex equity, to aid in the development of the learning module and their format

*See timeline attached, page 3.

6. Determined learning module titles, and coordinated them with existing level outlines per State Curriculum Guide for Electricity/Electronics.
7. Developed content of each learning module that was based upon researched needs.
8. Upon completion of each learning module, drafts were reviewed by staff, designated specialists, and state personnel. After corrections and/or revisions were made, modules were sent to reproduction.
9. Worked on the learning modules, working predetermined hours each day, outside of district contract hours, utilizing consultant, vacations, weekends and summer (1978) for concentrated efforts.

Personalized Instructor Inservice (Activities for Objectives 3.5*, 3.6)

1. The Project Staff developed instruction sheets showing the recommended procedural steps for use, adoption or adaptation of Phase I and II. The Staff also developed visual and support materials that illustrated how the guide and modules are intended to be used. Flyers for publicizing were also developed.
2. Copies of instruction sheets, fliers, modules, State Curriculum Guide for Electricity/Electronics were reproduced for dissemination during each of the regional personalized instruction inservices.

(Activities for Objectives 3.7, 3.8, 3.9)*

3. The Project Director, with the assistance of the State Industrial Education personnel, designated locations and made necessary arrangements for personalized instruction inservice meetings in each of the 3 state regions. Fliers were mailed out with adequate lead time so as to inform all necessary personnel to be involved. Every attempt was made to locate each inservice in an accessible area at a time that was available to teachers. Inservices were held at California State University at Los Angeles, Mt. Pleasant High School, San Jose and Woodruff R.O.C., Stockton, California. Each personalized instruction inservice presentation included:

*See timeline, attached, page 3.

1. Introduction
2. Background (history)
3. Use of State Curriculum Guide for Electricity/Electronics
4. Use of Modules
5. Advantages of articulation, etc.
6. Procedures for procurement of (3 and 4)
7. Evaluation

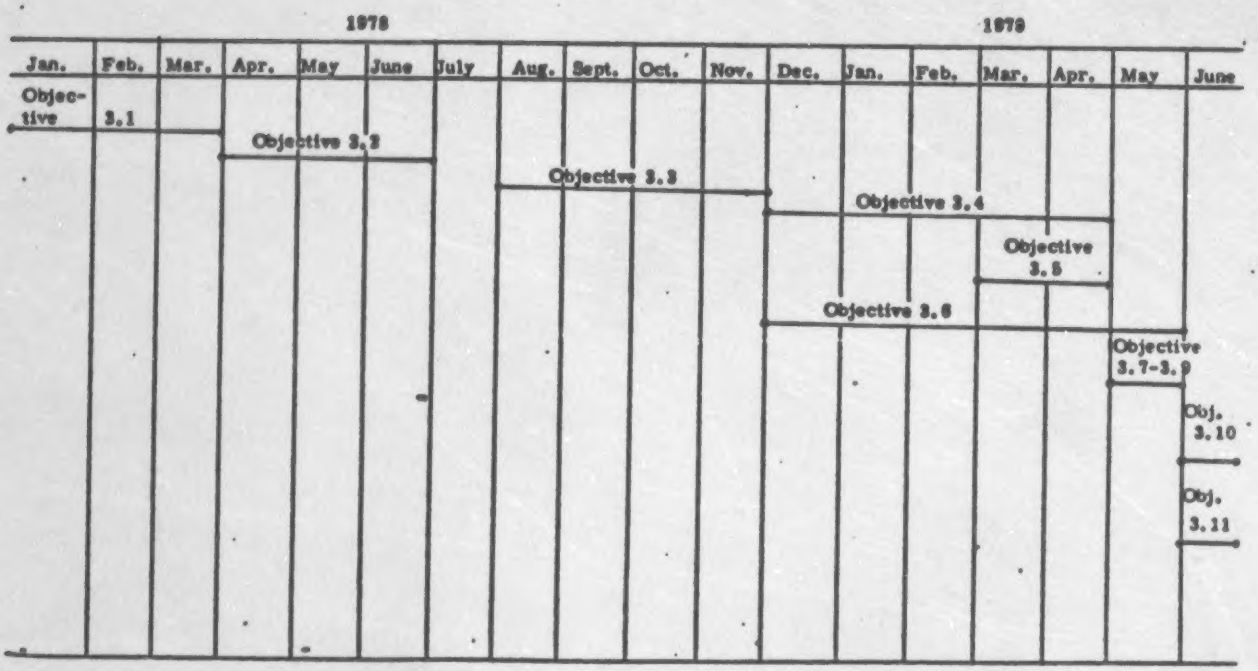
4. (Activities for Objective 3.10)

After the completion of the three regional inservices, 100 copies of the State Curriculum Guide for Electricity/Electronics Phase II Instructional Learning Modules were shipped to the appropriate state office for dissemination.

5. (Activities for Objective 3.11)

Evaluations were completed by participants in the three regional inservices. Copies of each evaluation were sent to the Industrial and Health Program Manager with the Quarterly Report.

PROJECT TIMELINE



FINAL REPORT
PROJECT NUMBER 43-69427-3-8-244

RESTATEMENT OF PROJECT - OBJECTIVES AND ANTICIPATED OUTCOMES

3.1 By April 1, 1978, each learning module format will be developed upon needs, tasks and competencies identified in the State Curriculum Guide for Electricity/Electronics.

3.2 By June 1, 1978, staff will develop, for statewide dissemination, twenty Instructional Modules for Level I (grades 7-8) of the State Curriculum Guide for Electricity/Electronics.

3.3 By December 1, 1978, the project staff will develop, for statewide dissemination, twenty-four Instructional Modules for Level II (grade 9) of the State Curriculum Guide for Electricity/Electronics.

3.4 By May 1, 1979, the project staff will develop, for statewide dissemination, sixteen Instructional Modules for Level III (grade 10) of the State Curriculum Guide for Electricity/Electronics.

3.5 By May 1, 1979, the project staff will have developed an organized plan for the implementation of the regional inservices.

3.6 By June 1, 1979, the project staff will have supplied copies of the State Curriculum Guide for Electricity/Electronics for Instructional Modules for use and evaluation at each of the regional inservices.

3.7 By June 1, 1979, designated staff members will have conducted three regional inservices within the State of California, one each in coastal, central and southern regions.

3.8 By June 1, 1979, the project staff will have conducted inservices on the use, application, and availability of the State Curriculum Guide for Electricity /Electronics and its Instructional Modules.

3.9 By June 1, 1979, designated project staff members will have, during regional inservices, recommended the adoption or adaptation of the State Curriculum Guide for Electricity/ Electronics and its Instructional Modules as a means of equalizing educational opportunities for students in the Electricity/Electronics field.

3.10 By June 1, 1979, the project staff will provide 100 copies of each Instructional Module to the State Dissemination Center.

RESTATEMENT OF PROJECT - OBJECTIVES AND ANTICIPATED OUTCOMES (Cont'd.)

3.11 By June 30, 1979, the Learning Modules and inservice of these modules will be evaluated by inservice participants and follow-up by State staff, annually, regarding effective implementation.

FINAL REPORT
PROJECT NUMBER 43-69427-3-8-244

DETAIL THE ACTUAL OUTCOMES AND THE MANNER BY WHICH THESE OUTCOMES WERE MEASURED

Objective 1.

Outcome: Learning module format was developed on schedule. Each learning module reflected the needs, tasks and competencies identified in the State Curriculum Guide for Electricity/Electronics. Evaluation/Measurement: Learning modules were developed prior to the stated completion date of April 1, 1978.

Objective 2.

Outcome: Twenty Instructional Modules for Level I (grades 7-8) were developed. Actually, two were developed - a Level I-A, nine-week model and a Level I-B, an eighteen-week model. One hundred copies of each were sent to the State for dissemination, per request from regional inservices. *
Evaluation/Measurement: 1. Learning Modules were developed and submitted to the Project Director for reproduction, prior to the completion of the project. 2. Recipients of learning modules are using developed materials.

Objective 3.

Outcome: Twenty-four Instructional Modules for Level II (grade 9) were developed. One hundred copies were sent to the State for dissemination per request from regional inservices. **
Evaluation/Measurement: 1. Learning Modules were developed and submitted to the Project Director for reproduction prior to the completion of project. 2. Recipients of the Learning Modules are using developed materials.

Objective 4.

Outcome: Sixteen Instructional Modules for Level III (grade 10) were developed, and submitted to the Project Director for reproduction prior to the completion of the project. Over 127 copies were disseminated during the three regional inservices. Additional copies, to meet other requests are being run by the State Department of Education.***

Evaluation/Measurement: 1. Learning Modules were developed and submitted to the Project Director for reproduction prior to the completion of the project. 2. Recipients of Learning Modules are using developed materials. 3. Evaluation forms were filled out at each of the three regional inservices. ****

* See Appendix A (Level I - A and B)
** See Appendix B (Level II)
*** See Appendix C (Level III)
**** See Appendix D (Evaluations from Regional Inservices)

DETAIL THE ACTUAL OUTCOMES AND THE MANNER BY WHICH THESE OUTCOMES WERE MEASURED (Cont'd.)

Objective 5.

Outcome: Regional inservices were held at California State University at Los Angeles, Woodruff R.O.C. Center in Stockton, California, and at Mt. Pleasant High School in San Jose, California. All were well attended and evaluations were very positive.*
Evaluation/Measurement: See attached evaluation of participants at each of the inservices. Project staff had to rely on hosts for inservice accommodations. Locations seemed to be good; attendance was high.

Objective 6.

Outcome: Level III Learning Modules were printed and used as sample for the three regional inservices. Phase I Curriculum Guides are being run and disseminated by the State. The Phase I Curriculum Guide and the Learning Modules were reviewed and explained during each of the inservices.
Evaluation/Measurement: See attached evaluations from participants at each of the inservices.

Objective 7.

Outcome: Inservices were held in Los Angeles, Stockton, and San Jose, CA. Attached are copies of the information brochure and agenda. Meetings were well attended. **
Evaluation/Measurement: See attached evaluation forms.

Objective 8.

Outcome: See Outcomes 5, 6, 7.
Evaluation/Measurement: See attached evaluation forms.

Objective 9.

Outcome: The prime goal of this project is the adoption or adaptation of any or all of the developed materials.
Evaluation/Measurement: This goal was stressed during each inservice by the presentors and staff.

* See Appendix D (Evaluations from Regional Inservices)
** See Appendix E (Information Brochure and Agenda)

DETAIL THE ACTUAL OUTCOMES AND THE MANNER BY WHICH THESE OUTCOMES WERE MEASURED (Cont'd.)

Objective 10.

Outcome: One hundred copies of Level I and Level II were sent to the State for dissemination. Level III was disseminated by the Project staff during the three regional inservices.
Evaluation/Measurement: One hundred copies of Level I and II were delivered to the State Department of Education for dissemination by the Project Director.

Objective 11.

Outcome: Participants filled out an evaluation form, which covered the items on the inservice agenda.
Evaluation/Measurement: See attached inservice evaluation forms.*

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* See Appendix D (Evaluations from Regional Inservices)

DESCRIBE THE DIFFERENCE BETWEEN ANTICIPATED OUTCOMES AND THOSE DESCRIBED IN THE PROJECT OBJECTIVES AND REASONS FOR ANY DIFFERENCES.

Objective 1.

Anticipated outcome met. No deviation from stated objective.

Objective 2.

Anticipated outcome met. Level I was printed in two forms, Level I-A (9-week program) and Level I-B (18-week program). Level I-B is Level I-A plus an additional nine weeks. The reasons for the A-B format was to save duplication during dissemination.

Objective 3.

Anticipated outcome met. No deviation from stated objective.

Objective 4.

Anticipated outcome met. No deviation from stated objective.

Objective 5.

Anticipated outcome met. No deviation from stated objective.

Objective 6.

Level III was used as a sample and a copy was given to each inservice participant. Level I, II, and Phase I curriculum material were made available to participants with an order form. These materials are now with the State Department of Education for dissemination. Level III was developed first, to save time in the development of Levels I and II.

Objective 7.

Anticpated outcome surpassed. Last inservice was on June 2, 1979. More participants attended than pre-registered at each of the inservices. The period of time happened to correspond with the gasoline shortage..

Objective 8.

Anticpated outcome met/surpassed, because of the increased number of participants. (see attached inservice agendas.)*

* See Appendix F (Inservice Agenda)

DESCRIBE THE DIFFERENCE BETWEEN ANTICIPATED OUTCOMES AND THOSE DESCRIBED IN THE PROJECT OBJECTIVES AND REASONS FOR ANY DIFFERENCES (Cont'd.)

Objective 9.

Anticipated outcome met. (See actual and anticipated outcomes 5, 6, 7.)

Objective 10.

Anticpated outcome met.

Objective 11.

Anticipated outcome met. (See participant evaluation attachments.)*

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* See Appendix D (Evaluations from Regional Inservices)

FINAL REPORT
PROJECT NUMBER 43-69427-3-8-244

FOR CURRICULUM DEVELOPMENT PROJECTS DESCRIBE HOW THE PROJECT HAS OR WILL RESULT IN IMPROVED TEACHING TECHNIQUES OR CURRICULUM MATERIALS

The Electricity/Electronics Curriculum Guide Phase II (Instructional Modules for Levels I, II, III) has dealt with the development and use of instructional modules for use in the classroom as a vehicle to implement the articulated, competency-based curriculum outlines presented in the Electricity/Electronics Curriculum Guide (Phase I).

Educators, using these competency-based modules, can adapt or adopt these modules to any existing or new program without major cost expenditures. These modules, as presented during the three regional inservices, hopefully will act as a catalyst for educators who desire a revision or restructuring of their Electricity/Electronics curriuclum. The module development provides for teacher-based modification related to methodology, instructional resources, textbooks, equipment, laboratory systems, etc. Each instructional module contains the following:

1. Goals and Objectives (unit)
2. Outline
3. Pre-post Test (keyed)
4. Instruction references
5. Suggested Methodology
6. Demonstrations and Quest Activities
7. Student Handouts - Informational
8. Vocabulary Enrichment List
9. Student Worksheets
10. Related Instructional Activities and Graphical Illustration.

It is hoped that the Curriculum Guide and its Modules will be a measure of equalizing educational opportunities for students in the Electricity/Electronics programs throughout the State.

COMPLETED PARTICIPANT SUMMARY FORM

Attached are copies of the forms filled out by the participants of each of the three regional inservices. (See Request Forms from Regional Inservices)*

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* See Appendix G (Request Forms from Regional Inservices)

FINAL REPORT
PROJECT NUMBER 43-69427-3-8-244

DESCRIBE EXTENT OF DISSEMINATION OF PROJECT PRODUCTS AND/OR SERVICES

Each participant of each of the three regional inservices was given a copy of the Level III and an order form to request Level I, Level II and Phase I materials. These materials were forwarded to the State Department of Education for dissemination upon completion of reproduction. Other individuals were exposed to the project materials through California Industrial Education Association Section and State conferences. Some individuals were exposed through a State Department of Education project titled "Industrial Education Delivery System" which was contracted through Orange Unified School District. Information was also sent out, in publications of the California Council of Electronics Instructors Newsletters, and California Industrial Education News.

DESCRIBE ANY FOLLOW-UP ACTIVITIES AND GIVE DATE INFORMATION CAN BE EXPECTED

Project Objective 11 calls for the State Department of Education staff to follow-up, regarding effective implementation. Other activities that will check the effectiveness of material in the field will be through the (Demonstration) Site project.

DESCRIBE INTERNAL ACTIVITIES CARRIED OUT

In addition to the "Activities Conducted During the Project", we established a project office and resource center at the school of the project coordinator. A part-time secretary and technical illustrator were used to supplement the consultants who worked with the project coordinator in the development of the modules.

Maintenance of an active working advisory committee is very important. The East Side Union High School District Industrial Education Department maintains* Special Interest Groups which meet monthly. These groups were helpful in the overall production of the project. Many of these teachers worked as consultants on various parts of the project.

* See Appendix H (Industrial Education Special Interest Groups [S. I. G.], East Side Union High School District)

STATE ANY OBSERVATIONS THAT MIGHT BE HELPFUL TO OTHERS CONSIDERED FOR SUCH A PROJECT

- Support services from State were very helpful. Constant communication is very important.

- Maintain an active advisory committee and make sure you have the key person at participating firm who can make decisions and/or supply help needed to complete the project. Do not prostitute the committee with requests for jobs, materials, etc. - when they were asked to serve in an advisory capacity.

- Make sure the core working staff has adequate working conditions that support and/or facilitate their work. (i.e., files, reproductions of materials, etc.)

- Develop a contract for consultants and other workers so they are paid by the completion of units or tasks rather than by the hours. Set deadlines and follow them.

INDUSTRIAL EDUCATION SPECIAL INTEREST GROUPS (S.I.G.)

These are subject field committees composed of teachers spending the majority of their time in a specific area of the Industrial Education field (i.e., woodworking, metals, etc.) and is chaired by the Special Interest Group Leader. The Special Interest Groups meet monthly and are a subcommittee working under the Subject Coordination Committee (I.E.C.C.).

General Functions of the Special Interest Groups:

1. To study and review the curriculum in their respective areas, assure continuity and make recommended changes which are necessary.

2. Share educational and other expertise, experiences, techniques, and technical knowledge with other S.I.G. members.

3. Cooperatively develop new materials for district curriculum book.

4. Study and share new trends related to the specific Special Interest Group.

5. Study and share new trends in career opportunities related to the specific interest group.

6. Review and recommend to I.E.C.C. new text and supplementary textbooks respective to each area.

7. Coordinate and compile yearly district reproduction requests.

8. Review and recommend policies and procedures that may be pertinent to the Special Interest Group.

9. Coordinate purchasing procedures.

10. Cooperatively develop and recommend proposals which may merit support under federal, state, district or private programs and develop information necessary to make applications for financial support of said projects which have the approval of the Industrial Education Curriculum Committee.

11. Review and recommend summer curriculum development related to the Special Interest Group.

12. Make recommendations on other appropriate matters.

13. Work on special tasks as assigned by Subject Area Coordinator, Special Interest Group Leader, or as directed by group.

SPECIAL INTEREST GROUP LEADER (S.I.G. LEADER)

Special Interest Group Leader is appointed by and works with Subject Area Coordinator and strives to improve and maintain instruction for his/her Special Interest Group. The S.I.G. Leader is usually not a department chairperson, but does represent his/her group at the monthly Industrial Education Coordinating Committee meetings (I.E.C.C.)

Duties and Responsibilities:

1. Acts as an expert resource person for the Special Interest Group.

2. Represents their group at the Industrial Education Coordinating Committee meetings.

3. Works with Subject Area Coordinator and Special Interest Group to plan and conduct monthly S.I.G. meetings.

4. Develops agendas and minutes for each meeting.

5. Assists teachers when feasible.

6. Acts as resource person for teachers in group.

7. Helps coordinate and compile district yearly reproduction requests for their area.

8. Coordinates annual purchasing procedure.

9. As area specialist, the S.I.G. Leader may upon request work with Subject Area Coordinator to: give reports, review purchasing and any other items that may arise.

INDUSTRIAL EDUCATION

ELECTRICITY / ELECTRONICS

CURRICULUM
GUIDE
PHASE II

INSTRUCTIONAL MODULES

STATE OF CALIFORNIA

BUREAU OF INDUSTRIAL EDUCATION
DEPARTMENT OF EDUCATION

AGENDA - INSERVICE WORKSHOP

REGIONAL WORKSHOPS: May 5, Los Angeles - May 12, Stockton - June 2 San Jose

PRESENTERS:
Robert Lillo - Project Curriculum Coordinator
Nick Soffiotto - Project Staff Leader

WORKSHOP FOCUS: To review, evaluate, and disseminate the Level III Instructional Modules in order to facilitate immediate utilization by the classroom instructor. Modules correspond to the existing California State Curriculum Outlines Grade Levels 7-10, and each learning module contains all of the program materials in an innovative format.

PRESENTATION OUTLINE:

- I. Introduction (general)
  - A. Presenter Background
  - B. Project Background (needs assessment)
- II. Project Purpose Phase I
  - A. Competency-based curriculum
  - B. Easy to adapt or adopt to existing programs
  - C. Teacher flexibility is not ignored
  - D. Topics include "state of the art" technology
  - E. Development of the subject matter topics in outline form to act as a guide for instructor at grade levels 7-14.
  - F. Industry actively participated in the creation of these outlines.
  - G. Format and development of Phase I guide
  - H. Additional resource data included - textbooks and support systems
- III. Project Purpose Phase II
  - A. Development of 63 instructional modules based upon Level I, II, and III outlines
  - B. Discuss and demonstrate the basic content of each instructional module.
    - 1. Goals and objectives (unit)
    - 2. Outline (unit)
    - 3. Pre-Post Test (keyed)
    - 4. Instructor References
    - 5. Suggested Methodology
    - 6. Demonstrations and Quest Activities
    - 7. Student Handouts-Informational
    - 8. Vocabulary Enrichment List
    - 9. Student Worksheets
    - 10. Related Instructional Activities and Graphical Illustrations
  - C. Module listings Phase II - what is available
  - D. Dissemnation of Phase II, Level III instructional modules
  - E. Review of modules and sharing of ideas
- IV. Closing Statements
  - A. Implementation
  - B. Availability/Contacts
  - C. Questions
  - D. Forms - Fill out and submit

MODULE LISTING

Curriculum Guide Phase II

Level I Instructional Modules*

Unit 0 Orientation (9 week course)
Unit I Understanding Electricity
Unit II Safety
Unit III Methods to Generate Electricity
Unit IV Wiring Tools and Wire
Unit V Soldering
Unit VI Magnetism and Electromagnetism
Unit VII Circuits, Symbols, and Component Identification
Unit VIII Resistors and Identification Systems
Unit IX Available Sources of the Earth's Energy

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Unit 0 Orientation (18 week course)
Unit I Understanding Electricity
Unit II Safety
Unit III Methods to Generate Electricity
Unit IV Wiring Tools and Wire
Unit V Soldering
Unit VI Magnetism and Electromagnetism
Unit VII Circuit, Symbols, and Component Identification
Unit VIII Resistors and Identification Systems
Unit IX Small Appliance Repair
Unit X Available Sources of the Earth's Energy
Unit XI Exploring Occupations

---

*Instructional Module contents are coordinated with the California Industrial Education Electricity/Electronics Curriculum Guide, Level I, Curriculum outlines.

MODULE LISTING

Curriculum Guide Phase II

Level II Instructional Modules*

Unit	0	Orientation
Unit	I	Introduction to the World of Electricity
Unit	II	Electrical Safety
Unit	III	Historical Development of Electricity
Unit	IV	Basic Electrical Skills
Unit	V	Magnetism
Unit	VI	Nature of Electricity
Unit	VII	Methods of Producing Electricity
Unit	VIII	The Flow of Electricity Through Conductors and Insulators
Unit	IX	The Electrical Team
Unit	X	The Language and Symbols of Electricity
Unit	XI	Components, Switches, and Circuits
Unit	XII	Resistance and Resistors
Unit	XIII	Electric Lamps and Heating Devices
Unit	XIV	Electromagnetism
Unit	XV	DC and AC Electricity
Unit	XVI	Motors and Generators
Unit	XVII	Low Voltage Circuit Wiring of Signal Devices
Unit	XVIII	Circuit Protection Devices
Unit	XIX	House Wiring
Unit	XX	Introduction to Electronic Math Fundamentals
Unit	XXI	Communication Systems
Unit	XXII	Exploring Occupations in Electricity and Electronics
Unit	XXIII	Your Future in Electricity and Electronics

*Instructional Module contents are coordinated with the California Industrial Education Electricity/Electronics Curriculum Guide, Level II, Curriculum outlines.

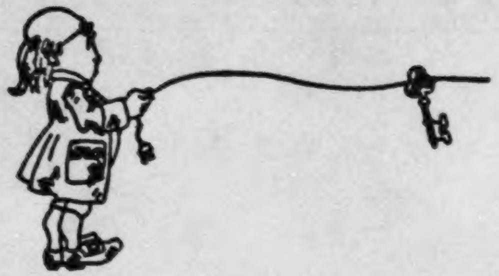
MODULE LISTING

Curriculum Guide Phase II

Level III Instructional Modules*

Unit	0	Orientation
Unit	I	Introduction to Electricity/Electronics
Unit	II	Electricity/Electronics Safety
Unit	III	Review of Fundamental Skills
Unit	IV	Direct Current Circuits
Unit	V	Graphical Illustrations
Unit	VI	DC Circuit Evaluation
Unit	VII	Electrical Energy and Power
Unit	VIII	Project Fabrication Techniques
Unit	IX	AC Fundamentals
Unit	X	Instrumentation
Unit	XI	Capacitance
Unit	XII	Inductance
Unit	XIII	Circuits Containing R, C, and L
Unit	XIV	Vacuum Tubes and Solid-State Electronics
Unit	XV	Exploring Occupations in Electricity and Electronics

*Instructional Module contents are coordinated with the California Industrial Education Electricity/Electronics Curriculum Guide, Level III, Curriculum outlines.



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project **Inservice Workshop**	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?						
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?						
4. How helpful do you think these curriculum materials will be to you?						
5. Were the physical arrangements adequate for the workshop?						
6. Was the media appropriate? (If used)						
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: ______________________________

____

____

____

THANK YOU!

State Electricity/Electronic
Curriculum Project
C/O Mt. Pleasant H.S.
1750 S. White Road
San Jose, CA 95127

Atten. Robert Lillo

If you have any additional comments or inquiries reguarding the Electricity/Electronics Curriculum Guides - Phase II - please drop us a line at the above address. We are interested in your feedback in reference to the materials presented in the guide, any "problems" or errors that you might locate, and of course any constructive suggestions. We welcome your input, and invite you to contact us if you desire any assistance in program developement and implementation.

Robert E Lillo

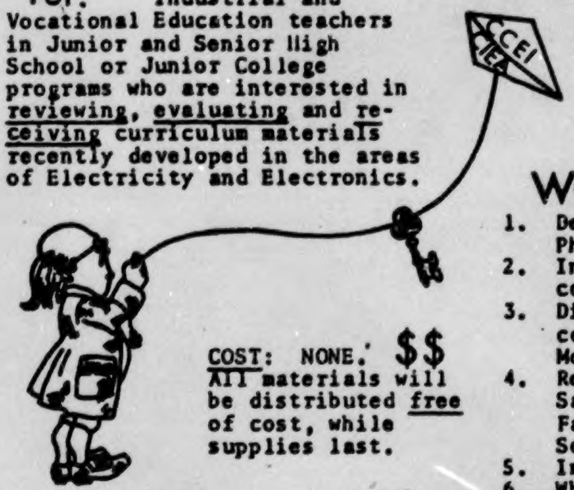
COMMENTS:

STATE OF CALIFORNIA: DEPARTMENT OF EDUCATION
INDUSTRIAL EDUCATION DIVISION

INSERVICE WORKSHOP

Electricity/Electronics Curriculum Learning Modules

For: Industrial and Vocational Education teachers in Junior and Senior High School or Junior College programs who are interested in reviewing, evaluating and receiving curriculum materials recently developed in the areas of Electricity and Electronics.



Sponsored By:

The State of California, Industrial Education Division and the State Electricity/Electronics Curriculum Project.

COST: NONE. $$
All materials will be distributed free of cost, while supplies last.

Level I - 7-8 grade
Level II - 9 grade
Level III - 10 grade
Level IV - 11-14 grade
> 63 modules being developed!

Types Of Materials To Be Distributed:

- *Complete course materials
- *Illustrated handouts and worksheets
- *Pre-post unit test
- *Vocabulary list and activities
- *Instructor topic guides
- *Quest activities
- *Answer keys

WORKSHOP AGENDA

1. Describe the State Curriculum Guide Phase I (course topic outlines).
2. Introduce Phase II (scope and content).
3. Discuss and Demonstrate basic content of each Instructional Module.
4. Review all modules (example: Safety - Graphical Illustrations - Fabrication - Vacuum Tubes and Solid State Electronics - etc.).
5. Implementation into your program?
6. What levels are available?
7. Dissemenation of modules.
8. Sharing of ideas.

Workshop Coordinators

Chris Almeida, State Consultant
Keith Bush, Project Director
Robert Lillo, Project Coordinator
Nick Soffiotto, Project Leader

TAKE HOME A WEALTH OF NEW innovative materials .... Interested? Don't delay mail in the pre-registration card and indicate which regional workshop you will attend. Cards should be mailed prior to 4/27/79.

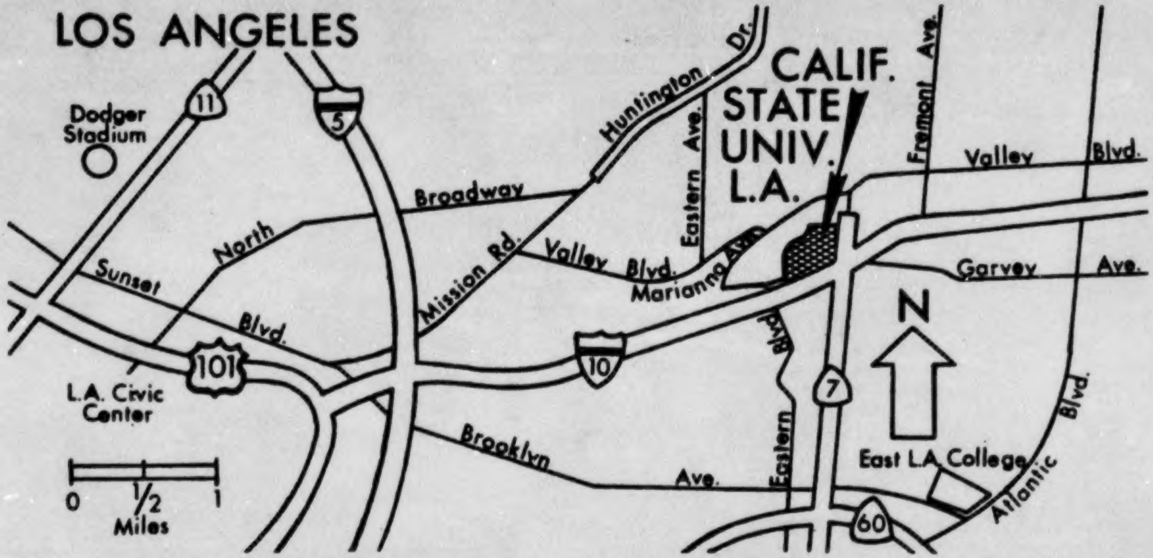
WORKSHOP DATES AND LOCATIONS

May 5 - Cal. State University L.A., (5151 University Drive) 9:00AM-12:00PM
Rm. 126 Engin/IA Building use parking lot F, via Circle Drive

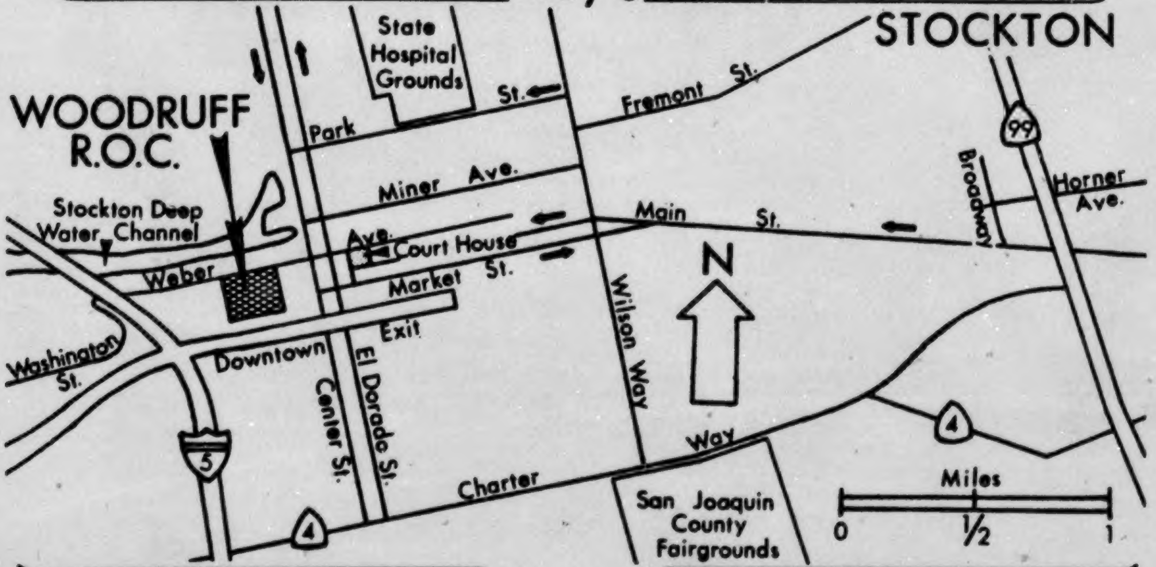
May 12 - Woodruff ROC Stockton, (302 W. Weber Ave.) 9:00AM-12:00PM
Electronic Building

June 2 - Mount Pleasant H.S. San Jose, (1750 S. White Rd.) 9:00AM-12:00PM
Electronics Lab. Rm. 408

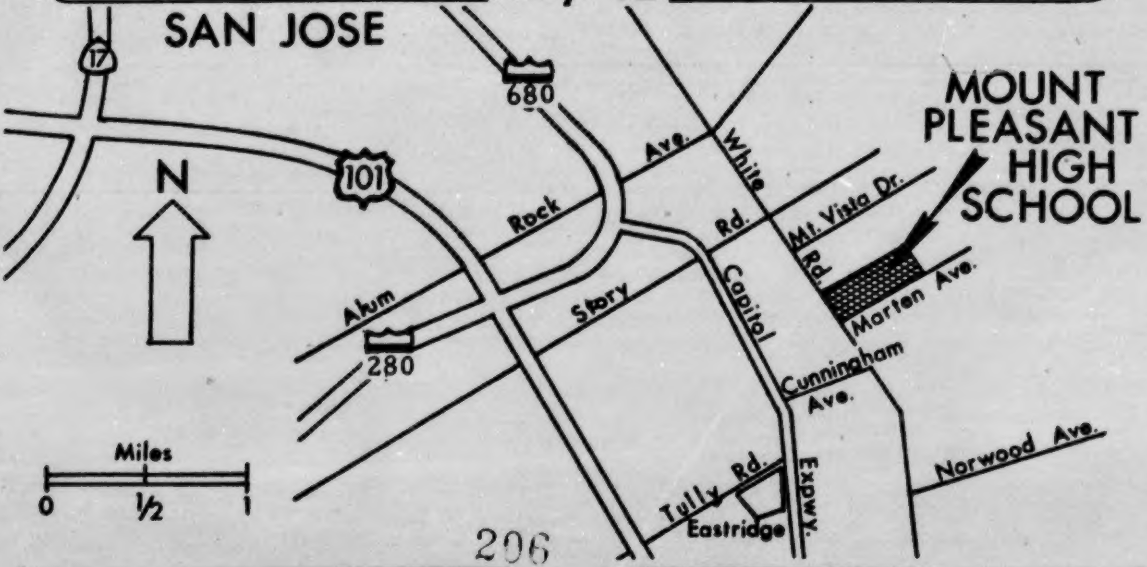
(Map locations on back)


LOS ANGELES
CALIF. STATE UNIV. L.A.
Dodger Stadium
11
5
Huntington Dr.
Eastern Ave.
Fremont Ave.
Valley Blvd.
Broadway
North
Sunset Blvd.
Mission Rd.
Valley Blvd.
Marianna Ave.
Garvey Ave.
N
101
10
7
Eastern Blvd.
Atlantic Blvd.
L.A. Civic Center
Brooklyn Ave.
Eastern
East L.A. College
60
0 1/2 1
Miles

May 5


STOCKTON
State Hospital Grounds
WOODRUFF R.O.C.
Park St.
Fremont St.
99
Broadway
Horner Ave.
Miner Ave.
Stockton Deep Water Channel
Main St.
Ave.
Court House
Weber
Market St.
N
Exit
Downtown
Washington St.
Center St.
El Dorado St.
Wilson Way
5
Charter Way
4
4
San Joaquin County Fairgrounds
Miles
0 1/2 1

May 12


SAN JOSE
17
680
MOUNT PLEASANT HIGH SCHOOL
N
101
Ave.
White Rd.
Rock
Mt. Vista Dr.
Alum
Rd.
Capitol
Marten Ave.
Story
280
Cunningham Ave.
Miles
0 1/2 1
Norwood Ave.
Tully Rd.
Eastridge
Expwy.

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Philip Anderson Title
School Hollywood High Phone
Street 1521 N Highland Ave
City Hollywood State Cal Zip 90028

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II
PHASE I OUTLINE

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name JIM ARGUBRIGHT Title TEACHER
School PERSHING JR. Phone 465-3234
Street 8204 SAN CARLOS BLVD
City SAN DIEGO, State CA Zip 92119

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Phase I outline ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Kamiran Badrkhan Title Dist. Electronics Consultant
School Los Angeles Unified School Dist Phone (213) 625-5552
Street 636 West 17th st.
City Los Angeles State Calif. Zip 90015

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

need both levels

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE .... ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name L. J. Bennett Title Electronics Teacher
School Webster Jr. High Phone (213) 478-2041
Street ~~[illegible]~~ 11330 W. Graham Place
City Los Angeles State CA. Zip 90064

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I OUTLINE ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name T. R. BERTOLINO Title INSTRUCTOR
School VENTURA COLLEGE Phone (805) 642-3211
Street 4667 TELEGRAPH RD.
City VENTURA State CA Zip 93003

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name W.M. Bowers Title Tea[illegible]
School J.H. Foshay Phone
Street 7902 Apperson st
City Sunland State Calif Zip 91[illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I Outline ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name CHARLES BOYD Title Teacher Elect -TV
School Fullerton Union High School Phone (714) 871-9000
Street 201 E. Chapman Ave.
City Fullerton State Ca Zip 92634

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☑
(Check proper box)

Please Print

Name CHARLES R. BROWN Title TEACHER.
School BELMONT HIGH Phone (213) MA8-5701
Street 1575 W. 2rd STREET
City LOS ANGELES State CA Zip 90026

Remarks: TWO OF THE FEEDER JR. HIGHS DO NOT HAVE ELECTRONIC PROGRAMS.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name W. BROWN Title
School CAL STATE L.A. INDUSTRIAL STUDIES DEPT Phone
Street 5151 STATE UNIV. DRIVE.
City LOS ANGELES State CA Zip 90032

Remarks: WOULD LIKE LEVEL IV TOO!

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Phase II / Outline ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name STEVEN L. BRUHNS Title DEPT. CHAIR. ELEC INSTR
School GAHR HIGH SCHOOL Phone 924 5566 EX 5267
Street 11111 ARTESIA BLVD
City CERRITOS State CALIF Zip 90701

Remarks: SUPER MATERIALS.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name John J. Burns Title Teacher
School Sequoia JR High Phone 805 527-5055
Street 3570 Cochran
City Simi State CA Zip 93063

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Textbook Level II pp 461, 465
Phase I outline ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name CARR, WILLIAM C. Title Asst Prof
School L. A. City College Phone 663-9141
Street 855 N. Vermont Ave.
City Los Angeles State Ca Zip 90029

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II PHASE #1
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name FLOYD R. ELLIOTT Title INSTRUCTOR
School WASHINGTON IRVING JR H Phone 213-2562123 + 213-786-9183
Street 3010 ESTARA AVE.
City L. A. State CA. Zip 90065
Remarks: WE NEED THIS MATERIAL AS SOON AS POSSIBLE.

Request for Industrial Educatic.. Electricity/Electronic.
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box

Please Print

Name FROZINA, DONALD J. Title ELECTRONICS INSTRUCTOR
School CALIFORNIA STATE UNIVERSITY LOS ANGELES & INDUSTRIAL STUDIES DEPT. Phone 224-3221
Street 5151 STATE UNIVERSITY DRIVE
City LOS ANGELES State CA Zip 90032
Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase one outline ■
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name GRIFFIN, FRANK Title TEACHER
School WARREN HIGH SCHOOL Phone (213) WA 36711
Street 8941 DE PALMA AVE
City DOWNEY State CA Zip 90241
Remarks:

Request for Industrial Educatio.. Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I - Outline

Level I - 7-8 grade ☐

Level II - 9 grade ☐

(Check proper box)

Please Print

Name DAVE HARLAN Title Instructor - Audio & TV - Telecommunication - Broadcasting

School Southern California College Phone 714/ 832-2950

Street 15656 Yermo

City Whittier State CA Zip 90603

Remarks:

Request for Industrial Educatio.. Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II PHASE I ✓

PLEASE SEND → CURRICULUM GUIDE 7-12

OUR DISTRICT DOES NOT HAVE ANY COPIES OF THESE. WE WILL DUPLICATE FOR OUR SCHOOLS

Please forward to the address indicated below 1 complete copy of:

Level I - 7-8 grade ☑

Level II - 9 grade ☑

(Check proper box)

Level II as soon as available

Please Print

Name GORDON A. HART Title ELECTRONICS TEACHER

School AGOURA HIGH SCHOOL Phone 213 8891266

Street 28545 W. DRIVER

City AGOURA State CA Zip 91301

Remarks: DISTRICT - LAS VIRGENES U.S.D

Request for Industrial Educatio.. Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II PHASE 1 OUTLINE

Please forward to the address indicated below 1 complete copy of:

PHASE 1 OUTLINE ☑

Level I - 7-8 grade ☐

Level II - 9 grade ☑

(Check proper box)

Please Print

Name VIC HUGO Title ELECTRONICS TEACHER

School EDISON HIGH Phone

Street 21400 MAGNOLIA AVE

City HUNTINGTON BEACH State CALIF Zip 92646

Remarks: NEED A SAP

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I - Outline ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Bud Johnston Title Electricity Instructor
School Bloomington High School Phone 824 4248
Street 10750 Laurel Avenue
City Bloomington State CA Zip 92316

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I outline ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name MAURICE KOPP Title
School CAL. STATE UNIV LOS ANGELES Phone 213- 224 3227
Street 5151 UNIVERSITY DRIVE
City LOS ANGELES State CAL. Zip

Remarks: ELECTRONICS TEACHER TRAINING – URGENTLY NEED CURRENT CURRICULUM MAT'LS FOR PROSPECTIVE NEW TEACHERS & TO UPDATE OUR FACY.

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name LOUIS LATERZA Title TEACHER
School HELIX HIGH SCHOOL Phone 466-4192 EXT. 47
Street 7323 UNIVERSITY AVE
City LA MESA State CA Zip 92041

Remarks: PLEASE HOLD CARD AND SHIP LEVEL II WHEN READY.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name DON LINDSEY Title Electronics Teacher
School Colton High School Phone 825-6594
Street 777 W. Valley Blvd
City Colton State Ca Zip 92324

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I OUTLINE ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name LYLE G. MAJESKA Title ELECTRICITY TEACHER
School LA PUENTE HIGH Phone (213) 336-1241
Street 15615 E. NELSON AVE
City LA PUENTE State CA Zip 91744

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I OUTLINE ☒

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name CLARENCE MARKS Title TRAINING COORDINATOR
School NORTH VALLEY OCCUPATIONAL CENTER Phone (213) 365-9645
Street 11450 SHARP AVE.
City MISSION HILLS State CA. Zip 91345

EXCELLENT PROJECT!
Remarks: CONSIDER WORKING MORE CLOSELY W/ L.A. UNIFIED SCHOOL DIST.

Request for Industrial Education Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE 1 ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name ED MARSOOBIAN Title PROF.
School CAL STATE UNIV., L.A. Phone 213-224-3221
Street 5151 STATE DR.
City LOS ANGELES State CALIF. Zip 90032

Remarks:

Request for Industrial Education Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I OUTLINE ☑
Level I – 7-8 grade ☐
Level II – 9 grade ☑
(Check proper box)

Please Print

Name W. PAUL MATTHEWS Title ASSOC PROF
School RIVERSIDE CITY COLLEGE Phone (714) 684-3240 EXT 281
Street 4800 MAGNOLIA AVE.
City RIVERSIDE State CA Zip 92506

Remarks: RIVERSIDE UNIFIED HAS ONLY ONE HIGH SCHOOL TEACHING ELECTRICITY'S
MAYBE WITH THESE MATERIALS, WE CAN PROMOTE RE-INSTITUTING SOME PROGRAMS.

Request for Industrial Education Electricity/Electronics

Curriculum Guide Phase II

Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☐
Level II – 9 grade ☐
(Check proper box)

Please Print

Name William M. MEANS JR Title STUDENT TEACHER
School Cal STATE L. A. Phone 358-9169
Street 209 E. BENKUD
City MONROVIA State CAL Zip 91016

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II PHASE I OUTLINE ✓
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☐
(Check proper box)

Please Print

Name BRUCE W. MOORE Title ELEC/DRAFT. INSTRUCTOR
School EL DORADO H.S. Phone (213)967-6908
Street 928 N DAMATO DRIVE
City COVINA State CAL. Zip 91724
Remarks: ALSO INTERESTED VERY MUCH IN LEVEL IV

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II *
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name LARRY D. PATTEN Title TEACHER
School LAKEWOOD H.S. Phone 425-1281 (213)
Street 4400 BRIERCREST
City LAKEWOOD State CA Zip 90713
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I OUTLINE
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name ED PATTERSON Title RESOURCE TEACHER
School SAN DIEGO CITY SCHOOLS Phone 714/293-8248
Street 4100 NORMAL STREET ROOM 2109
City SAN DIEGO State CA Zip 92103
Remarks: WILL COORDINATE WITHIN DISTRICT

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print →

Name FRANK PETRACCORE Title ELECTRONICS
School ARCADIA H.S. Phone 446 0131
Street 180 ~~[illegible]~~ CAMPUS DR
City ARCADIA State CA Zip 91006

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print →

Name RONALD A REIS Title ELECT. TEACHER
School BURBANK HIGH SCHOOL Phone 8457121 (213)
Street 902 NORTH 2nd ST
City BURBANK State CAL Zip 91504

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print →

Name FRANK LOUIS ROAGLE Title VOCATIONAL ELECTRONICS INSTRUCTOR
School WOODROW WILSON High School Phone (213) 2231131
Street 4500 MULTNOMAH STREET
City LOS ANGELES State CA Zip 90032

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I OUTLINE ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name GEORGE SATURENSKY Title TEACHER
School SOUTH GATE JR HS Phone (213) 567-1431
Street 4100 FIRESTONE BLVD
City SOUTH GATE State CA Zip 90280

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I outline ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name *MORRIS E. SAWYER* Title *Industrial Arts Teacher*
School *Olive Jr. High School* Phone *962-8416*
Street *13701 E. Olive St.*
City *Baldwin Park* State *CA* Zip *91706*

Remarks: *Would like Phase I Curriculum Guide if available*

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I OUTLINE ✓

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name J.G. SIMMONS Title INSTRUCTOR
School EL CAMINO COLLEGE Phone
Street
City [illegible] State CA. Zip

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

[illegible]
Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Richard Smith Title ELEC. INSTRUCTOR
School CRAWFORD Phone 583-25[illegible]
Street 4191 COLTS WAY
City SAN DIEGO State Ca Zip [illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I OUTLINE!!

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name ROGER SMITH Title TEACHER - ELECTRONICS
School C V H S Phone 213-24[illegible]
Street 4400 RAMSDELL AVE
City LA CRESCENTA State CA Zip 91214

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I outline ✓

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Harry A. Taber Title Teacher (Electronics) Radio
School Roosevelt Jr. High Phone 2966237
Street 3366 Park Blvd.
City San Diego State Calif. Zip 92103

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name ROBERT TISDALE Title ELEC/AU TEACHER
School NORTH HIGH Phone 399-7351
Street 300 GALAXY
City BAKERSFIELD State CA Zip 93308

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I [illegible] ☑
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Edward Wiebe Title Sales [illegible]
School Lab-Volt Systems Phone (213) [illegible]
Street 1671 Palm Dr
City Covina State CA Zip [illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I OUTLINE ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name PAUL WURZER Title ELECTRONICS INSTRUCTOR
School INGLEWOOD ADULT SCHOOL Phone 674-6748
Street 115 W KELSO ST
City INGLEWOOD State CA Zip 90301

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name JIM ATCHISON Title ELECTRONICS INSTRUCTOR
School CALIF. School for the DEAF Phone
Street P.O. Box 607
City CUPERTINO State CA. Zip 95014

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I guide ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name JAY Bell Title Teacher
School Paradise High School Phone
Street
City Paradise State CA Zip 95969

Remarks: Continue work on Level four.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II
Phase I ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name GEORGE E. BRAMLETT Title Inst Elec
School COLLEGE OF SAN MATEO Phone 574-6161
Street 1700 W HILLSDALE BL
City SAN MATEO State CA Zip 94402

Remarks: 2y college

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name ROY BRIXEN Title ELECTRICITY I[illegible]
School BALBOA HIGH SCHOOL Phone 333 2777
Street 1000 CAYUGA AVE
City SAN FRANCISCO State CA Zip 94112
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I — ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name DAVID J. BURNETT Title GRADUATE STUDENT IA
School CAL POLY SLO. Phone 541-2495
Street 1255 ORCUTT RD B-26
City SAN LUIS OBISPO State CA Zip 93401
Remarks: IF POSSIBLE PLEASE SEND COPY OF PHASE I

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name DON E BURT Title TEACHER
School LIVE OAK H.S Phone
Street 1505 E.MAIN
City MORGAN HILL State CA Zip 95037
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name F.R. DUNGAN Title TEACHER
School SCROP Phone 842-3061 (OFF) 449-9457 (HOME)
Street 1678 CAMBRIAN DR
City SALINAS State CA Zip 93906
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Art Edwards Title Electronics Instruct.
School San Mateo High School Phone 348-8050
Street 506 N. Delaware
City San Mateo State Ca Zip 94401
Remarks: Intermediate school will be sending 8th grade students to H.S. for instruction next semester.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ----- ☒
Level I – 7-8 grade ☐
Level II – 9 grade ☐
(Check proper box)

Please Print

Name GROVER FERGUSON Title
School Oakland High School Phone 451-1208
Street 3233 Park Blvd.
City Oakland State Calif. Zip 94610
Remarks: I would also like Level IV when available.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name MILTON E. FIFE Title ELECTRONICS [illegible]
School SUNNYVALE HIGH [illegible] Phone 73[illegible]
Street P.O. BOX [illegible]
City SUNNYVALE State CA Zip 94[illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name TOM FORGETTE Title VOC. ARTS DIRECTOR
School NORTH MONTEREY COUNTY HIGH SCHOOL Phone
Street 400 CASTROVILLE BLVD.
City CASTROVILLE State CA Zip 95012

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name J. D. FROST Title Assoc Prof
School CAL Poly State U. Phone 546-2139
Street Industrial Technology Dept (IA)
City SAN Luis Obispo State CA Zip 93407

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Everett Gant Title Teacher
School Lynbrook HS Phone 255 1665
Street P.O Box F
City Sunnyvale State Ca. Zip
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I CURRICULUM GUIDE → ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name CHARLES GOODSPEED Title Ind-Voc Instructor
School NORTH MONTEREY COUNTY HIGH Phone
Street 400 CASTROVILLE BLVD.
City CASTROVILLE State CA Zip 95012
Remarks: FANTASTIC PREPARATION, PHASE I-OUTRAGEOUS, PHASE II - GOOD MATERIAL
LET THEM KEEP WORKING ON THEM

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Robert Hand Title Training Instructor
School [illegible] Live Oak High Phone 408 779 2019
Street 125 Linda Ln
City Morgan Hill State Ca. Zip 95037
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name GERALDINE HERRICK Title Electronics [illegible]
School SAN JOSE Vocational Cntr Phone 294-[illegible]
Street 639 Chatsworth Pl
City San Jose State Ca. Zip 95[illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name TOM HOWDEN Title TEACHER
School SANTA TERESA Phone 578-[illegible]
Street 6150 SNELL AVE
City SAN JOSE State CA Zip 9512[illegible]

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name WILLIAM C. KIM Title INSTRUCTOR
School FRANCISCO MIDDLE SCHOOL Phone 5845525
Street 1344 POWELL ST
City SAN FRANCISCO State CA Zip 94133

Remarks: EXCELLENT WORK

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name TED KOVACH Title INDUSTRIAL EDUCATION INSTRUCTOR [illegible]
School ADULT EDUCATION FREMONT UNION H.S. DISTRICT Phone 244-4929
Street 2166 SAN ANTONIO PL.
City SANTA CLARA State CA Zip 95051

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name WALT LANGOSCH Title MANAGER
School TECHNICAL EDUCATION SERVICES Phone 408-733-7430
Street 2525 RYDER STREET
City SANTA CLARA State CALIF. Zip 95051

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name FRANK LOGAN Title ELECTRONICS INST.
School FORMER LIVE OAK H.S. Phone (408) 779-1017
Street 18350 SHADOWBROOK WY
City MORGAN HILL State CA Zip 95037

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name PETER MADSEN Title TEACHER
School SILVER CREEK HIGH SCHOOL Phone 651-6685
Street 2414 MIDDLEFIELD AVE
City FREMENT State CA Zip 94538

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☐
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name David Marson Title Teacher
School Golden Gate Academy Phone 531-0110
Street 3800 Mountain Blvd.
City Oakland State CA. Zip 94619

Remarks: I can realy use this Info. Thank you!

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Mitch McEF[illegible] Title Student
School Cal Poly State University Phone 544-145[illegible]
Street 684 Foothill Blvd. Apt. C
City San Luis Obispo State CA. Zip 93401

Remarks: I'm a curriculum advisor for San Luis Christian Academy

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I ☒
Level I - 7-8 grade ☐
Level II - 9 grade ☒
(Check proper box

Please Print

Name Leonard Meurer. Title Teacher
School Vanden High School Phone
Street Markley & De Ronde
City Travis State CA Zip 94535

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Phase I ☐
Level I - 7-8 grade ☒
Level II - 9 grade ☒
(Check proper box)
Who? Available 11 thru 14 ☒

Please Print

Name Robert C Miller Title Instructor, I.Ed.
School Cupertino HS. Phone 735-6926
Street 10100 Finch Ave.
City Cupertino State Calif Zip 95014.

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☑

Please forward to the address
indicated below 1 complete copy of:

Level I - 7-8 grade ☑
Level II - 9 grade ☑
(Check proper box)

Please Print

Name ALTON F. OSBORN Title ELECT. INSTR
School ALISAL HIGH SCHOOL Phone
Street 777 WILLIAMS RD
City SALINAS State CA. Zip 93901

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I-GUIDE ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name BILL POPE Title INSTRUCTOR
School CHICO SENIOR HIGH SCH Phone 895-3037
Street 5 CAPISTRANO PLACE Home (916) 342-4765
City CHICO State CA Zip 95926

Remarks: Excellent Material -

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☑
(Check proper box)

Please Print

Name CHARLES H. RHINES Title TEACHER
School OVERFELT H.S Phone
Street 1835 Cunningham Ave
City SAN JOSÉ State CA. Zip 95122

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Jim Shaul Title Electronics Teacher
School Aragon H.S. Phone 342-2080
Street 900 Alameda de los Pulgas
City San Mateo State Ca. Zip 94402

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☐
(Check proper box)

Please Print

Name Hunter Stockton Title Instructor
School Monterey Peninsula College Phone 384-[illegible]
Street 3183 [illegible] DR
City MARINA State CA Zip 93933

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

will use level I for Shop.
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Dave Sykes Title Teacher
School Independence Phone 921-1776
Street 1776 Ed. Pk Dr.
City San Jose State Ca Zip 95133

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name ROBERT M. THORSON Title ELECTRONICS INSTR
School PETERSON HIGH SCHOOL Phone
Street
City SUNNYVALE State CA Zip 94087

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I: Indust. Ed. Electricity/Electronics
.GRADE LEVELS 7-14 ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)
Level III ☑

Please Print

Name Larry Todd Title Electronics Instructor
School Sonoma County ROP Phone
Street 2555 Mendocino Ave Room 111E
City Santa Rosa State Ca Zip 95401

Remarks: We have 3 schools {Analy in Sebastopol, Rancho Cotati in Cotati, Healdsburg} Can we have 3 copies!
and 3 instructors

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
Phase I ☑ (Check proper box)

Please Print

Name DAVID A. VAUDRIN Title Student IA (Senior)
School CAL POLY, San Luis Obispo Phone 541-0667
Street 1535 ROYAL WAY #4
City San Luis Obispo State CA Zip 93401

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I – ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Richard H. Waldron Title Teacher
School Pleasanton Phone Home 846-9157 / 846-3845
Street 4750 First Street
City Pleasanton State Calif. Zip 94566

Remarks: Manna from Heaven!!! God bless you for your perseverance!!

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☑
(Check proper box!

Please Print

Name Philip E W[illegible] Title [illegible]
School [illegible] Phone [illegible]
Street 5001 [illegible]
City Santa [illegible] State [illegible] Zip [illegible]

Remarks:

Request for Industrial Educatio.. Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box!

Please Print

Name Des W[illegible] Title [illegible]
School Los Gatos High Phone
Street P.O. Box 248
City Los Gatos State Calif Zip 95030

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☑
(Check proper box)

Please Print

Name FRED. K. WEBER Title
School CONTRA COSTA College Phone 415 235-7800 x281
Street 2600 Mission Bell Drive
City San Pablo State CA. Zip 94806
Remarks: Need to have Phase III – Check dept. [illegible].

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☑
(Check proper box)

Please Print

Name GLEN CARLSON Title INSTRUCTOR
School CONTRA COSTA COLL Phone 415-2[illegible]
Street 2600 MISSION BELL DRIVE
City SAN PABLO State CA Zip 94806
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name ALLEN F. MERRIMAN Title Electronic Instructor
School Lodi High School Phone 209-334-1031
Street 3 So. Pacific Ave.
City Lodi State Ca Zip 95240
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I PLEASE

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name JOHN AVAKIAN Title ELECTRONICS INSTR.
School TRACY HIGH SCHOOL Phone 209 [illegible]
Street 315 E. 11TH ST.
City TRACY State CA. Zip 95376
Remarks: [illegible] MORE-MORE

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I PLEASE

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☐
(Check proper box)

Please Print

Name William L. Boyles Title ELECTRONICS INSTRUCTOR
School MERCED COLLEGE Phone 723-4521 EXT 393/249
Street 3600 M ST
City MERCED State CA Zip 95340
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☑
Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Don Delaney Title Electronics Teacher AV Coordinator
School Tulare Western H.S. Phone 686-4761
Street 824 West Maple Ave
City Tulare State CA Zip
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Dr. G.J. Brandstatt Title Assoc. Prof./Ind. Educ. D.
School Cal-State Univ. Long Beach Phone 213-498-4683
Street 1250 Bellflower Blvd.
City Long Beach State CA Zip 90840
Remarks: Materials to be used in Elect. Teacher Prep. Program

---

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Frank Caunt Title Instructor
School Chico Phone 877-2144
Street 6151 Alamo Way
City Paradise State CA Zip 95969
Remarks: I would be willing to pay for Phase I.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☒

I will be including junior high school students next year. If possible, please send both.

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒ ←
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Clayton T Wasley Title Elect. teacher
School Lemoore High School Phone (209) 924-9715
Street 18th Ave and Bush St
City Lemoore State Calif Zip 93245
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Aer McCullough Title ELECTRONICS INSTRUCTOR
School VACAVILLE HIGH School Phone 707 448-6828
Street 100 MONTE VISTA
City VACAVILLE State CA Zip 95688

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name DAVID N. THOMPSON Title TEACHER & COORDINATOR SJUSD Electronics
School MIRA LOMA HIGH Phone 484-2581
Street 4000 EDISON AVE.
City SACRAMENTO State CA. Zip 95821

Remarks: Great MATERIALS - Keep up the PRINTING! EACH TEACHER NEEDS THESE.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE 1 ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Warren Dunn Title Instructor
School Fred C Beyer HS Phone (209) 521-1660
Street 1717 Sylvan Ave
City Modesto State Cal Zip 95355

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

CURRICULUM GUIDE PHASE I
LEVEL II ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name TOM CROWE Title ELECTRONICS TEACHER
School STAGG HIGH SCHOOL Phone (209) 478-1241
Street 1621 BROOKSIDE RD
City STOCKTON State CALIF Zip 95207
Remarks: LEVEL III & IV WHEN AVAILABLE

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Curr. Guide Phase I ☒
~~[illegible]~~

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Leo Sinclair Title Instructor
School EDISON Phone 944 4126
Street 1425 S Center
City Stockton State Cal Zip
Remarks: Formal Project III & IV

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Nolan Wingo Title Chrm. Sci. Dept.
School Livingston High Phone
Street 1616 3rd
City Livingston State Calif Zip 95334
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I — ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☐
Level II – 9 grade ☒
(Check proper box)

Please Print

Name TERRY EDWARDS Title InsT., ElecT. & AuTo (9-12)
School MoDoc High SCHOOL Phone (916) 233-3385
Street 900 NORTH Main
City ALTURAS State CA. Zip 96101

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☒

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Michael L Sagie Title Electronics Instructor
School Rio Linda Senior High Phone 991-4432
Street 6309 Dry Creek Road
City Rio Linda State Calif. Zip 95662

Remarks: good!

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Phase I ☑

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Dorence E. Young Title Electronics Instructor
School Las Plumas High Phone 533-1301
Street 2380 Las Plumas Ave
City Oroville State Ca Zip 95965

Remarks: These materials will be especially helpful in our curriculum.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I And II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)
Level IV ☑

Please Print →

Name B. D. Alderson Title Elect Inst.
School Piner High School Phone 707-528-5245
Street 1700 Fulton Rd.
City Santa Rosa State Ca Zip 95401

Remarks: Thank God for your Dedication — Please Continue through 4

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Bob – thank You!
~~Phase I (Help!!)~~ ☑
Level I – 7-8 grade ☐
Level II – 9 grade ☐
(Check proper box)

Please Print →

Name RICHARD RUMRILL Title ELECTR INSTR
School ANTIOCH HIGH Phone 415/757-6560
Street 700 W. 18TH ST.
City ANTIOCH State CA Zip 94509

Remarks: GREAT! NEXT LEVEL VITAL. WHAT CAN I DO?

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print →

Name ROBERT PRESTON Title TEACHER
School SANTA CLARA HIGH Phone (408) [illegible] 298 5331
Street 377 ATLANTA AVE
City SAN JOSE State CA Zip 95125

Remarks: STUFF LOOKS GREAT!!

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II PHASE I
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Vic Ybarra Title INSTRUCTOR
School WOODRUFF ROC Phone 944-4633 (
Street 302 WEST WEBER AVE
City STOCKTON State CA Zip 95203

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address
indicated below 1 complete copy of:

PHASE I ☑
Level I – 7-8 grade ☑
Level II – 9 grade ☑
III & IV (Check proper box)

Please Print

Name CHARLES E. SUTTON Title ELECT INST
School NAPA HIGH SCHOOL Phone 258-5341
Street 2475 JEFFERSON ST
City NAPA State CF Zip 94558

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

PHASE I ☑

Please forward to the address
indicated below 1 complete copy of:

Level I – 7-8 grade ☑
Level II – 9 grade ☑
(Check proper box)

Please Print

Name Ray Martin Title teacher
School Hoover H.S. Phone
Street 5550 N. First St
City Fresno State CA Zip 93710

Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name WALTER M. KASABIAN Title ELECTRONICS INSTR
School McLANE H.S Phone 225-1400
Street 2727 No CEDAR
City FRESNO State CA Zip 93703
Remarks:

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name Roland Gaubert Title Instructor
School Del Oro H.S. Phone 652-7243
Street 3301 Taylor Rd.
City Loomis State Ca. Zip 95650
Remarks: Hope the state will fund completion of project.

Request for Industrial Education Electricity/Electronics
Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

PHASE I ☒
Level I – 7-8 grade ☒
Level II – 9 grade ☒
(Check proper box)

Please Print

Name JIM RUTHERFORD Title EL. INSTRUCTOR
School PLACER HIGH SCHOOL Phone 916/885-4581
Street 825 ORANGE ST.
City AUBURN State CA Zip 95603
Remarks: Looks GOOD - PLEASE DEVELOP ADVANCED LEVELS

Request for Industrial Education Electricity/Electronics Curriculum Guide Phase II
Instructional Modules Level I or II

Please forward to the address indicated below 1 complete copy of:

Phase I ☒
Level I — 7-8 grade ☒
Level II — 9 grade ☒
(Check proper box)

Please Print

Name STEVE LINDEN Title INSTRUCTOR
School NEVADA Union High Sch. Phone 273-4431
Street Ridge Rd.
City Grass Valley State Ca Zip 95945

Remarks:

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
. Were the Inservice Workshop objectives attained?					✓	
. Did you receive curriculum materials, and was the quality satisfactory?						
. How well was the presentation organized and delivered?				✓		
. How helpful do you think these curriculum materials will be to you?						✓
. Were the physical arrangements adequate for the workshop?			✓			
. Was the media appropriate? (If used)						
. Was enough time allowed for you to review, evaluate, and receive materials?						
. Should there be further development of curriculum materials? (11th & 12th grade et	Comments: Yes.					

Remarks:

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				X		
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?				X		
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?		X	use	map	to find	build
6. Was the media appropriate? (If used)				X		
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes.					

Remarks: Lots of good work - This should aid the area of electronic instruction greatly.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Super Job-					

Explain - abrie LETTER

Remarks:

Glad the state have gotten off there lazy asses -

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?				X		
3. How well was the presentation organized and delivered?					X	
4. How helpful do you think these curriculum materials will be to you?			X			
5. Were the physical arrangements adequate for the workshop?			X			
6. Was the media appropriate? (If used)			X			
7. Was enough time allowed for you to review, evaluate, and receive materials?			X			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Too Much stress on What a good job. They did!					

Remarks:

THANK YOU!

State Electricity/Electronic
Curriculum Project
C/O Mt. Pleasant H.S.
1750 S. White Road
San Jose, CA 95127

Atten. Robert Lillo

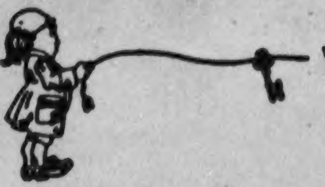
If you have any additional comments or inquiries reguarding the Electricity/Electronics Curriculum Guides - Phase II - please drop us a line at the above address. We are interested in your feedback in reference to the materials presented in the guide, any "problems" or errors that you might locate, and of course any constructive suggestions. We welcome your input, and invite you to contact us if you desire any assistance in program developement and implementation.

Robert E. Lillo N. Soffiotto

COMMENTS:

John J. Dinicolo
AVHS
44900 N. Divison
Lancaster, CA. 93534

what additional federal funds can I apply for to get monies?



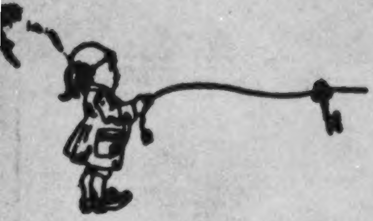
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE LA	Please) MAY 6	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

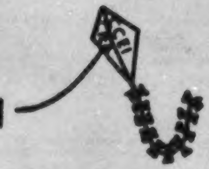
California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project **Inservice Workshop**	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Now, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: DEFINITLY - 1st QUALITY MATERIALS FROM STATE LEVEL - SHOULD BE IN ALL AREAS OF IND. ARTS.					

Remarks:
Steve Budus
Gahr High
11111 ARTESIA
Cerritos Cal 90701

THANK YOU!



WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lille Nick Soffiotte

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Uh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes, same format					

Remarks: ______________________

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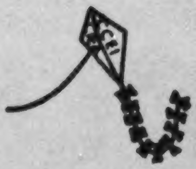
THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSULA	Please) 6 MAY 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lille Nick Soffiotte

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Uh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) YES	Comments:					

Remarks: ______________________

____

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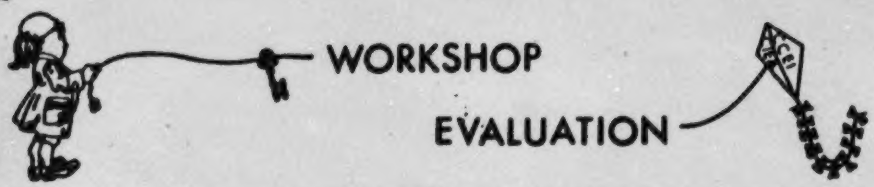
THANK YOU!



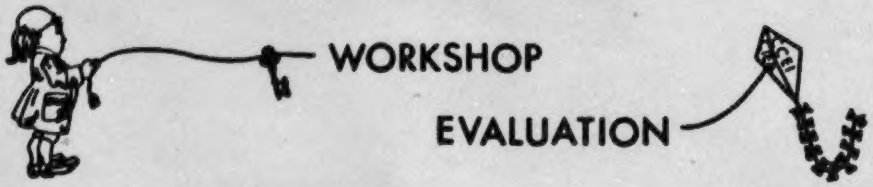
WORKSHOP EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education ctricity/Electronics Curriculum Project service Workshop	1 No Use	2 Eh, So So	3 [✓ Better Than Expected]	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?			IN ALL ASPECTS			
Did you receive curriculum materials, and was the quality satisfactory?						X
How well was the presentation organized and delivered?						X
How helpful do you think these curriculum materials will be to you?					X	
Were the physical arrangements adequate for the workshop?					X	
Was the media appropriate? (If used)						X
Was enough time allowed for you to review, evaluate, and receive materials?						X
Should there be further development of curriculum materials? (11th & 12th grade etc.) DEFINITELY	Comments:					

emarks: VERY WELL DONE. MUCH BETTER THAN EXPECTED.
WORTH 3 GALLONS OF GAS.

THANK YOU!



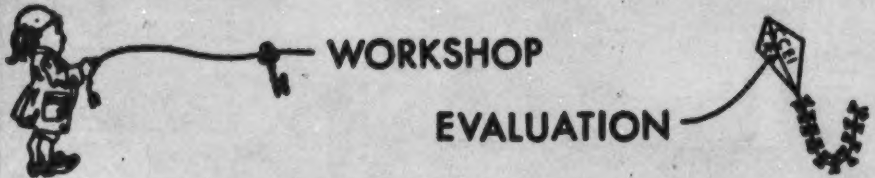
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Use	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			
2. Did you receive curriculum materials, and was the quality satisfactory?			✓			
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?	✓					
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: NO ENOUGH TIME!					

Remarks: We need this material translated to other languages.

THANK YOU!



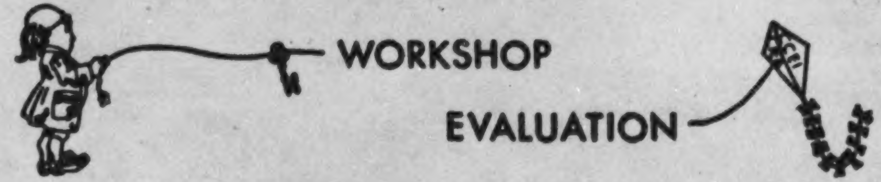
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSULA	Please) 5/6/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project **Inservice Workshop**	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?						
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: FANTASTIC - YES					

Remarks:

THANK YOU!!



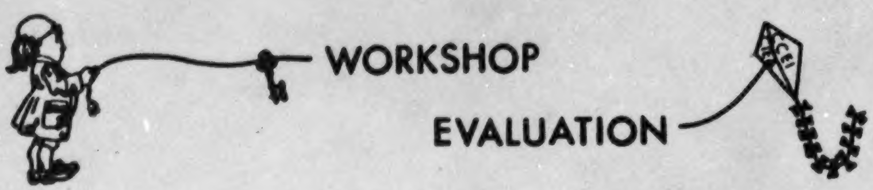
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project **Inservice Workshop**	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					*✓	
3. How well was the presentation organized and delivered?						✓✓✓
4. How helpful do you think these curriculum materials will be to you?					✓*	
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: * The materials are not at the level I need, but I can use these to help me ONE high school that teaches electronics. Looking forward to grade 11-14 materials.

THANK YOU!!



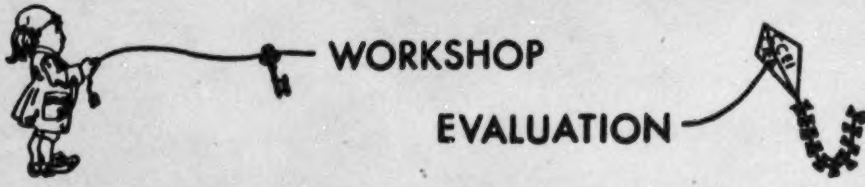
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto
Cal State	May 5		

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?		✓				
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Very Worth while Workshop					

Remarks:

THANK YOU!



WORKSHOP EVALUATION

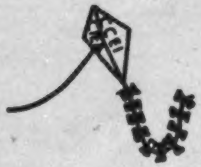
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto
CSLA	5-5-79		

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?					✓	
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)		✓				
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) Yes	Comments:					

Remarks: I have been to many workshops, this is one of the best when it comes to something I can use on a daily basis in the classroom.

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Calif State L.A	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				Looks	good	✓
2. Did you receive curriculum materials, and was the quality satisfactory?						?✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?			N	o		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes					

Remarks: Let me know about next meetings.

[illegible] Griffin

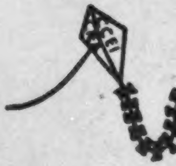
1312 E. Steele St

Home

Rosemead, CA 91770 213-288-0612

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			X			
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?			X			
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?		X				
6. Was the media appropriate? (If used)	X					
7. Was enough time allowed for you to review, evaluate, and receive materials?				X		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES - NEED MORE MEETINGS -					

Remarks:

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)		✓				
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes excellent,					

Remarks: Robert was excellent

THANK YOU!

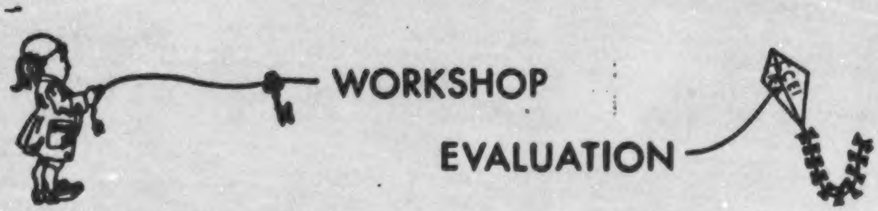
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in L.A.	Please) 5-5	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✗
2. Did you receive curriculum materials, and was the quality satisfactory?						✗
3. How well was the presentation organized and delivered?						✗
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✗
6. Was the media appropriate? (If used)						✗
7. Was enough time allowed for you to review, evaluate, and receive materials?						✗
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: Possibly question those present as to majority who need Phase I, II, III or IV & then concentrate on it

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) LOS Angeles	5 MAR 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes!					

Remarks: VERY GOOD JOB - Would APPRECIATE GRADES 13 & 14!

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) LA STATE	MAY 5, 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				X		
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?				X		
4. How helpful do you think these curriculum materials will be to you?				X		
5. Were the physical arrangements adequate for the workshop?	X X					
6. Was the media appropriate? (If used)		X				
7. Was enough time allowed for you to review, evaluate, and receive materials?		X				
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES					

Remarks: CLOSER TO SAN DIEGO

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 No Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?						X
Did you receive curriculum materials, and was the quality satisfactory?						X
How well was the presentation organized and delivered?						X
How helpful do you think these curriculum materials will be to you?						X
Were the physical arrangements adequate for the workshop?					X	
Was the media appropriate? (If used)						X
Was enough time allowed for you to review, evaluate, and receive materials?						X
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: "GREATSTUFF"					

Remarks: I WOULD LIKE TO VISIT YOUR FACILITY.

THANK YOU!

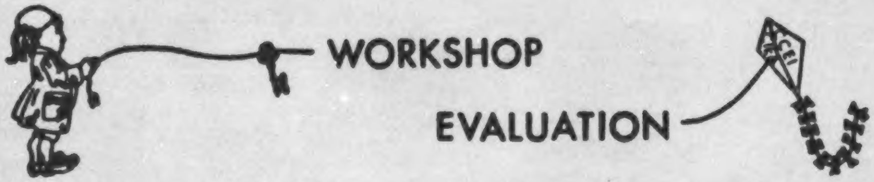
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in LA	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?						yes.
6. Was the media appropriate? (If used)						yes.
7. Was enough time allowed for you to review, evaluate, and receive materials?						yes.
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks:

THANK YOU!



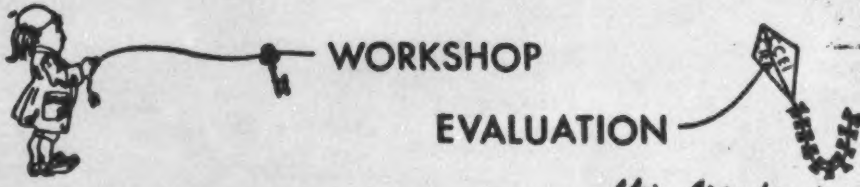
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSULA	Please) MAY 5 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?						XX
3. How well was the presentation organized and delivered?						x
4. How helpful do you think these curriculum materials will be to you?						XX
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?			X			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes					

Remarks: ____________________

THANK YOU!



WORKSHOP EVALUATION

Chris Aranda

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in L.A. Cal State	Please) 5 May 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				x		
2. Did you receive curriculum materials, and was the quality satisfactory?				|		
3. How well was the presentation organized and delivered?				|		
4. How helpful do you think these curriculum materials will be to you?				|		
5. Were the physical arrangements adequate for the workshop?				|		
6. Was the media appropriate? (If used)				|		
7. Was enough time allowed for you to review, evaluate, and receive materials?				|		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: ____________________

THANK YOU!

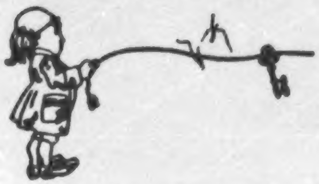
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSLA	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES, VERY INTERESTED IN 11TH & 12TH GRADE LEVEL MATERIALS.					

Remarks: THIS WORKSHOP HAS BEEN MORE THAN WORTHWHILE, REALLY APPRECIATE IT.

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE L.A	Please) MAY 5,79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?	✓					
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes. It is very necessary.					

Remarks:

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) Cal. State Univ Los Angeles.	May 5, 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

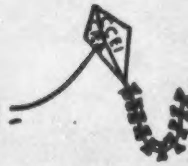
California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?					X	
5. Were the physical arrangements adequate for the workshop?			X			
6. Was the media appropriate? (If used)			X			
7. Was enough time allowed for you to review, evaluate, and receive materials?			X			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Definitely. Yes. Much Needed—					

Remarks: Excellent scientific & accurate approach to writing a much needed curriculum guide. Congratulations on your realization that knowledge & training are occurring on the Jr. & Sr. Hi level and not necessarily only in Jr. College. Most high School grads go to work

Maury Kopp

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) CSULA	5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				X		
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?					X	
4. How helpful do you think these curriculum materials will be to you?				X		
5. Were the physical arrangements adequate for the workshop?				X		
6. Was the media appropriate? (If used)			X Keystoning on over head projector			
7. Was enough time allowed for you to review, evaluate, and receive materials?				X		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes					

Remarks: It looks like alot of work was put into this

THANK YOU!

WORKSHOP EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in Cal State LA	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education ectricity/Electronics Curriculum Project nservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?					✓	
Did you receive curriculum materials, and was the quality satisfactory?						✓
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?						✓
Were the physical arrangements adequate for the workshop?				✓		
Was the media appropriate? (If used)					✓	
Was enough time allowed for you to review, evaluate, and receive materials?					✓	
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

emarks: Great Info. Very Helpful

THANK YOU!

WORKSHOP EVALUATION

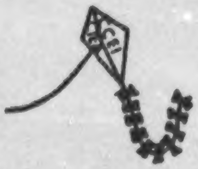
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE LA	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?					✓	
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) YES!!	Comments:					

Remarks:

THANK YOU!

WORKSHOP EVALUATION



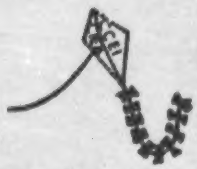
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			
2. Did you receive curriculum materials, and was the quality satisfactory?			✓			
3. How well was the presentation organized and delivered?			✓			
4. How helpful do you think these curriculum materials will be to you?			✓			
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: [illegible] how to get monies -					

Remarks: Well and done - But what the "hell" do you do without MONEY. WHEN THE DISTRICT PLACES ~~ALL~~ THE MEA MONEES IN THE GENERAL FUND.

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in USC	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

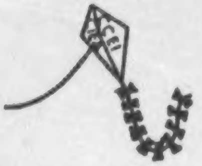
California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?				X →		
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes - I'd like to see Phase IV					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION



OCATION	DATE	TOPIC	PRESENTERS
(Fill in St LA.	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education ctricity/Electronics Curriculum Project service Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?			X			
Did you receive curriculum materials, and was the quality satisfactory?					X	
How well was the presentation organized and delivered?			X			
How helpful do you think these curriculum materials will be to you?						X
Were the physical arrangements adequate for the workshop?		X				
Was the media appropriate? (If used)			X			
Was enough time allowed for you to review, evaluate, and receive materials?			X			
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

emarks:

THANK YOU!

WORKSHOP

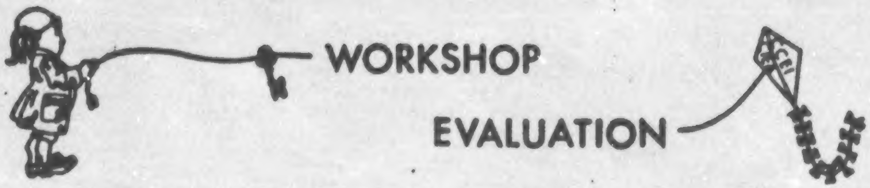
EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in L. A.	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: Thanks!!!

THANK YOU!



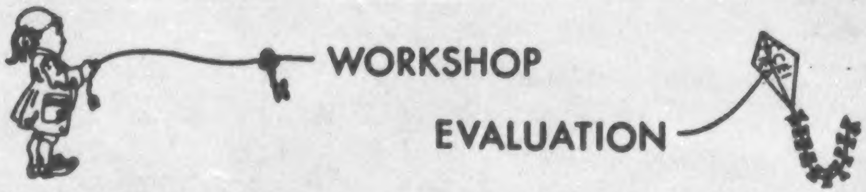
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Los Angeles	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					☒	
2. Did you receive curriculum materials, and was the quality satisfactory?					☒	
3. How well was the presentation organized and delivered?			☒			
4. How helpful do you think these curriculum materials will be to you?				☒		
5. Were the physical arrangements adequate for the workshop?				☒		
6. Was the media appropriate? (If used)						☒
7. Was enough time allowed for you to review, evaluate, and receive materials?						☒
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes continue Less background, please					

Remarks: Workshop period much to short to evaluate wonderful stuff.

THANK YOU!



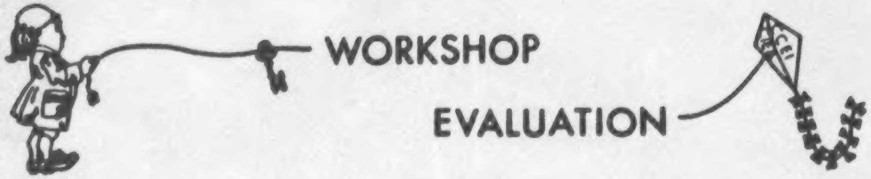
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSULA	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES, THIS PROJECT SHOULD BE CONTINUED TO INCLUDE ALL GRADE LEVELS.					

Remarks: EXCELLENT PROJECT! SHOULD BE CONTINUED.

THANK YOU!



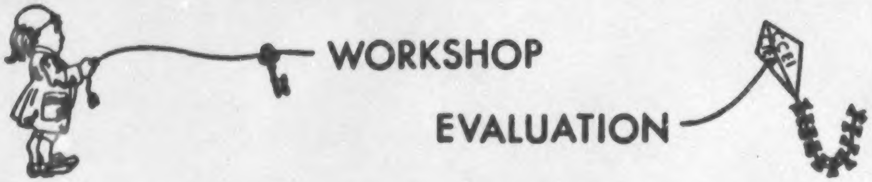
WORKSHOP EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)		
S.U. L.A. os Angeles	5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education ctricity/Electronics Curriculum Project ervice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?						✓
Did you receive curriculum materials, and was the quality satisfactory?					✓	
How well was the presentation organized and delivered?					✓	
How helpful do you think these curriculum materials will be to you?						✓
Were the physical arrangements adequate for the workshop?					✓	
Was the media appropriate? (If used)				✓		
Was enough time allowed for you to review, evaluate, and receive materials?						✓
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: very good. materials					

marks: Excellent

THANK YOU!



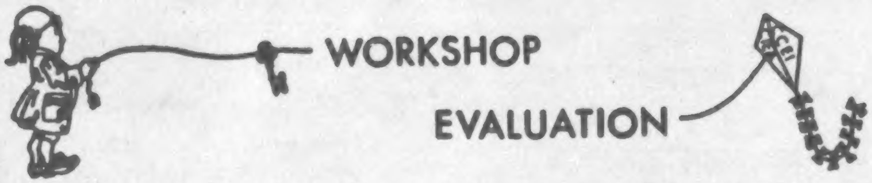
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)		
Cal. State L.A.	5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					X	
5. Were the physical arrangements adequate for the workshop?		Too Small				
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Should be a high priority					

Remarks:

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CSULA	Please) 5/5	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education
Electricity/Electronics Curriculum Project
Inservice Workshop

	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					X	
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?				X		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: a yes – in our district we have a Pre-Registration 10-12 – These areas would be good for ROP and advanced studies					

Remarks: someone is listening – I am in the process of submitting a ROP proposal – one of the requirements is to list the MOT's that will be covered

THANK YOU!

WORKSHOP EVALUATION

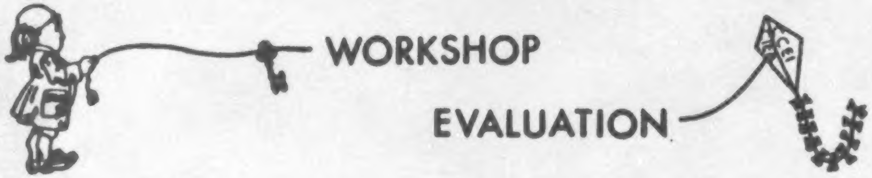
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE UNIV. LOS ANGELES	Please) MAY 5, 1977	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education
Electricity/Electronics Curriculum Project
Inservice Workshop

	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				X		
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?					X	
4. How helpful do you think these curriculum materials will be to you?					X	
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: NEED COMMUNITY COLLEGE LEVEL CURRICULUM MATERIALS					

Remarks:

THANK YOU!



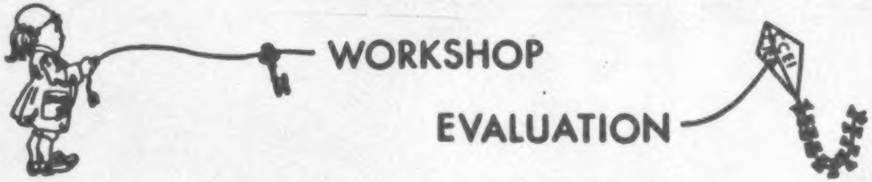
WORKSHOP EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education ctricity/Electronics Curriculum Project service Workshop	1 No Hum	2 Uh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?					✓	
Did you receive curriculum materials, and was the quality satisfactory?					✗	
How well was the presentation organized and delivered?					✗	
How helpful do you think these curriculum materials will be to you?					✗	
Were the physical arrangements adequate for the workshop?					✗	
Was the media appropriate? (If used)					✗	
Was enough time allowed for you to review, evaluate, and receive materials?					✗	
Should there be further development of curriculum materials? (11th & 12th grade etc,)	Comments:					

emarks: ______________________________

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Uh, So So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes					

Remarks: ______________________________

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE UNIV. L.A.	Please) MAY 5 '79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lille Nick Soffiotte

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			OK			
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES Did Wilson Riles hear you.?					

get word out
more funds
for this
type of things

Remarks: O.A. EXCELLENT PRESENTATION
& thanks for the donuts!

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in CAL STATE UNIV. Los Angeles	Please) 5-5-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lille Nick Soffiotte

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	G S
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES! YES! YES!					

Remarks: THIS IS HEAVEN SENT!

THANK YOU!

WORKSHOP EVALUATION

CATION	DATE	TOPIC	PRESENTERS
(Fill in STATE LA	Please) 5/5/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

nia State Department of Education city/Electronics Curriculum Project vice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
ere the Inservice Workshop ojectives attained?					✓	
id you receive curriculum aterials, and was the uality satisfactory?						✓
ow well was the presentation rganized and delivered?					✓	
ow helpful do you think ese curriculum materials ill be to you?						✓
ere the physical arrange-ents adequate for the orkshop?			Too Hot ✓			
as the media appropriate? f used)				✓		
as enough time allowed for ou to review, evaluate, and eceive materials?		Q+A ✓				
hould there be further evelopment of curriculum aterials? (11th & 12th rade etc.) YES!	Comments: Get with it and get the materials for 11 & 12 completed.					

arks: Congratulations on this project.
aterials are super. I wish this type of stuff was
ailable seven years ago when I started a new program.
aterial can be easily adapted to any course.
t work excellent! Material will be put into immediate use!

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in L.A. STATE	Please) 5/5/9	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?		✓	Shaky at first.			✓
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES!!					

Remarks: THE BEST state SPONSORED ACTIVITY IN MY 20+ YRS OF TEACHING!!

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES					

Remarks: ______________________________

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THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in L.A.S.U.	Please) 5 May 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes - Please 11, 12th					

Remarks: ______________________________

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THANK YOU!

WORKSHOP EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

lifornia State Department of Education	1	2	3	4	5	6
ctricity/Electronics Curriculum Project service Workshop	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
Were the Inservice Workshop objectives attained?						✓
Did you receive curriculum materials, and was the quality satisfactory?						✓
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?						✓
Were the physical arrangements adequate for the workshop?						✓
Was the media appropriate? (If used)						✓
Was enough time allowed for you to review, evaluate, and receive materials?						✓
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES					

emarks: ______________________________

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THANK YOU!

WORKSHOP

EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose -	Please) 2 June, 79.	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education ectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?			✓			
Did you receive curriculum materials, and was the quality satisfactory?						✓
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?						✓
Were the physical arrangements adequate for the workshop?			✓			
Was the media appropriate? (If used)						✓
Was enough time allowed for you to review, evaluate, and receive materials?						✓
Should there be further development of curriculum materials? (11th & 12th grade etc.) yes	Comments: Great Keep up the Good stuff					

emarks:

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?				✓		
How helpful do you think these curriculum materials will be to you?						✓
Were the physical arrangements adequate for the workshop?			✓			
Was the media appropriate? (If used)				✓		
Was enough time allowed for you to review, evaluate, and receive materials?			✓			
Should there be further development of curriculum materials? (11th & 12th grade etc.) yes	Comments:					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?				✓		
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes					

Remarks: EXCELLANT

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Definitely: with this type of material.					

Remarks: You have done a tremendous job of fantastic proportions — you deserve all the honors and benefits you may be attaining.

Pete Mossen

THANK YOU!

WORKSHOP

EVALUATION

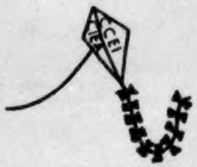
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				|		
2. Did you receive curriculum materials, and was the quality satisfactory?				|		X
3. How well was the presentation organized and delivered?				|		
4. How helpful do you think these curriculum materials will be to you?				|		X
5. Were the physical arrangements adequate for the workshop?				|		
6. Was the media appropriate? (If used)				|		
7. Was enough time allowed for you to review, evaluate, and receive materials?				|		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Not yet reviewed it.					

Remarks: Possible formallizing of proposals from agencies funding for various purposes.

THANK YOU!

WORKSHOP EVALUATION



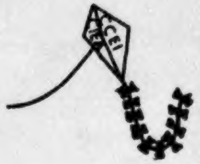
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes — !					

Remarks:

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	~~Keith Bush~~ Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			|			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes					

Remarks: The Trip was worth it!

THANK YOU!

WORKSHOP

EVALUATION

OCATION	DATE	TOPIC	PRESENTERS
(Fill in T [illegible] San Jose	Please) 2 June 71	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

ifornia State Department of Education ctricity/Electronics Curriculum Project service Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?						✓
Did you receive curriculum materials, and was the quality satisfactory?						✓
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?			✓		✓	
Were the physical arrangements adequate for the workshop?						✓
Was the media appropriate? (If used)						✓
Was enough time allowed for you to review, evaluate, and receive materials?						✓
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: please include hw.					

Remarks:

THANK YOU!

WORKSHOP

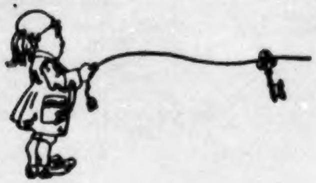
EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6/1	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						Yes
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?				✓		
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						Yes
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes					

Remarks: VERY Good workshop

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES!!					

Remarks: Missed a few details eg names & address to write because presentation was necessarily quick. Very Great however

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE, CA	Please) JUNE 2, 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes. THE QUALITY IS OUTSTANDING.					

Remarks: I FEEL THAT THIS OUTSTANDING WORK WILL BE A TREMENDOUS HELP TO TEACHERS AND FURTHER USE WILL RESULT IN A MARKED IMPROVEMENT IN ELECTRONIC INSTRUCTION. THANKS FOR A GREAT JOB WELL DONE.

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES WOULD LOVE TO SEE FURTHER DEVELOPMENT					

Remarks: AS A FIRST YEAR TEACHER THIS SHOULD BE A GREAT HELP TO ME. THANK YOU FOR ALL OF THE TIME SPENT OVER A [illegible] [illegible]

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 5-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes! 11th & 12th grade level. In teaching on the [illegible] is a great format for me to follow for my teaching level.					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION

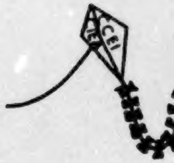
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6-2·79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: of course					

Remarks:

THANK YOU!

WORKSHOP



EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Mt. Pleasant H.S.	Please) 6-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) yes +	Comments: Higher					

Remarks: Very informative, Illustrative + Organized. Material made to be very versatile to add to or delete from.

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in MT Pleasant	Please) June 2 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✗
2. Did you receive curriculum materials, and was the quality satisfactory?						✗
3. How well was the presentation organized and delivered?			✗			✗
4. How helpful do you think these curriculum materials will be to you?					✗	✗
5. Were the physical arrangements adequate for the workshop?						✗
6. Was the media appropriate? (If used)						✗
7. Was enough time allowed for you to review, evaluate, and receive materials?						✗
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: 11, 12, 13, 14 are needed for standardization of ROP course curriculum					

Remarks: Commendable job - The states on the right track -

THANK YOU!

WORKSHOP

EVALUATION

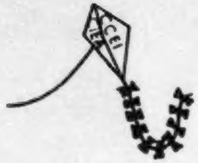
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?					✓	
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)		✓				
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) yes	Comments:					

Remarks: Looks like good materials may be very valuable for a busy Teacher

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?				X		
4. How helpful do you think these curriculum materials will be to you?				X		
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)				X		
7. Was enough time allowed for you to review, evaluate, and receive materials?				X		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES					

Remarks: Very Good use of Tax payers' money

THANK YOU!

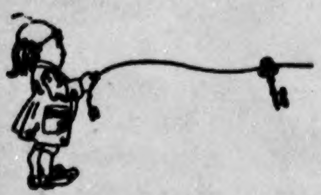
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in MT. PLEASANT HS. SAN JOSE, CA	Please) JUNE 2, 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

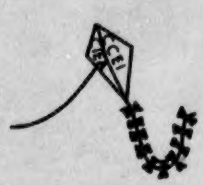
California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES, THE INDUSTRY HAS A GREAT NEED FOR WELL TRAINED PERSONNEL					

Remarks:

THANK YOU!



WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE, CA	Please) June 2, 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

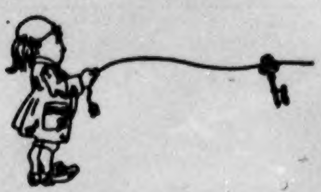
California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?			✓			
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) Yes	Comments:					

Remarks: Good job.

We need 11th & 12th grade.

Good job

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Mt. Pleasant H.S. SAN JOSE	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

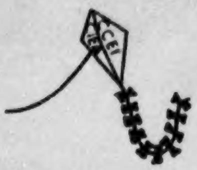
California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes -11 through 14					

Remarks: You did a great job, and your presentation was outstanding.

Frank Dunga

THANK YOU!

WORKSHOP EVALUATION



OCATION	DATE	TOPIC	PRESENTERS
(Fill in T.PLEASANT HS. AN JOSE	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education ectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?				✓		
Did you receive curriculum materials, and was the quality satisfactory?						✓
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?				✓		
Were the physical arrangements adequate for the workshop?				YES *		
Was the media appropriate? (If used)				YES		
Was enough time allowed for you to review, evaluate, and receive materials?				YES		
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: I THINK SO, YES.					

emarks: * STUFFY /VENTILATION DETRACTED FROM A FINE PRESENTATION, Thanks for an efficient, well prepared presentation and your total efforts in this area of education.

THANK YOU!

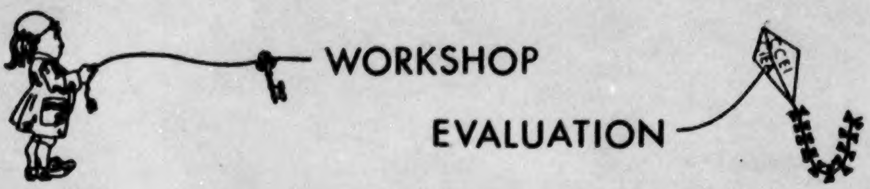
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?				X		
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)				X		
7. Was enough time allowed for you to review, evaluate, and receive materials?				X		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes					

Remarks: I Think this is great please continue!

THANK YOU!



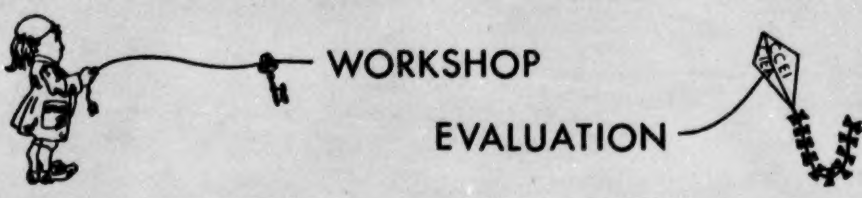
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in nt Pleasant Hi	Please) 2 June 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
. Were the Inservice Workshop objectives attained?						✓
. Did you receive curriculum materials, and was the quality satisfactory?						✓
. How well was the presentation organized and delivered?						✓
. How helpful do you think these curriculum materials will be to you?					✓	
. Were the physical arrangements adequate for the workshop?				Little warm		
. Was the media appropriate? (If used)						✓
. Was enough time allowed for you to review, evaluate, and receive materials?						✓
. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes - Excellant for use in Training future IA (Electronics) Instructors					

Remarks: A level 4 would be useful
in college teaching of IA instructors

THANK YOU!

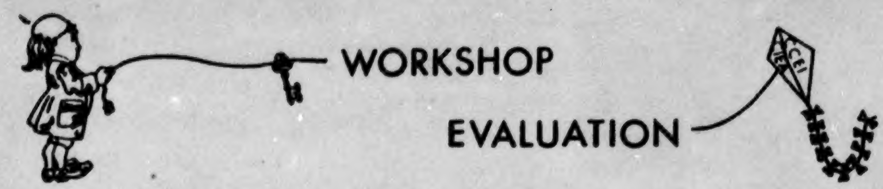


WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE	Please) JUNE 2	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	X
2. Did you receive curriculum materials, and was the quality satisfactory?					X	X
3. How well was the presentation organized and delivered?					X	X
4. How helpful do you think these curriculum materials will be to you?					X	X
5. Were the physical arrangements adequate for the workshop?					X	X
6. Was the media appropriate? (If used)					X	X
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: DEFINATELY					

Remarks: THESE ARE ALL THE THINGS WE THINK OF
BUT DONT HAVE TIME TO DO - ARRANGED IN A TRULY
SIGNIFICANT ORGANIZATION BASED ON YOUR JOB DESCRIPTION
ANALYSIS OF PHASE I - I THANK YOU, AND AS I USE +
ADAPT MATERIAL IT WOULD BE GREAT TO SEND TO you + RECIEVE
FROM you FURTHER THANK YOU! IDEAS + APPLICATIONS.



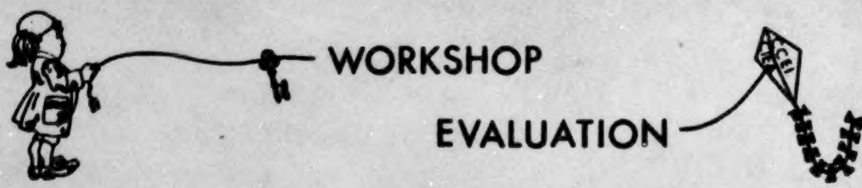
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN JOSE	Please) 6/2/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?	✓					
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?		✓				
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES					

Remarks: ______________________

THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in SAN Jose	Please) June 2, 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

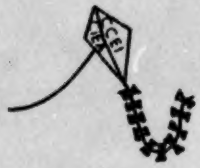
California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?		✓				
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes!					

Remarks: ______________________

THANK YOU!

WORKSHOP

EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in MT Pleasent H.S.	Please) 6-2-72	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					/	/
2. Did you receive curriculum materials, and was the quality satisfactory?					/	/
3. How well was the presentation organized and delivered?					/	/
4. How helpful do you think these curriculum materials will be to you?					/	/
5. Were the physical arrangements adequate for the workshop?					/	/
6. Was the media appropriate? (If used)					/	/
7. Was enough time allowed for you to review, evaluate, and receive materials?					/	/
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Mt. Pleasant H.S. San Jose	Please) 6-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			X			
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?			X			X
4. How helpful do you think these curriculum materials will be to you?				X		
5. Were the physical arrangements adequate for the workshop?			X			
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?			X			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes - Keep up the good work.					

Remarks: Excellent material, a difficult job well done. Your dedication to the teaching of our young people is greatly appreciated.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose, CA	Please) June 2, 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush ✓Robert Lillo ✓Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: I would like to ~~see~~ have Material for Grades 13 & 14.					

Remarks: Well Done I would like to have Material Developed for Grades 13 & 14.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in MT. PLEASANT	Please) 2 June 7	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						yes
2. Did you receive curriculum materials, and was the quality satisfactory?						yes
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						yes
6. Was the media appropriate? (If used)						yes
7. Was enough time allowed for you to review, evaluate, and receive materials?						yes
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					yes

Remarks: Go to Level IV! — PLEASE This program is Super!!

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?					✓	
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes.					

Remarks: Continue work on lece forr.

THANK YOU!

WORKSHOP

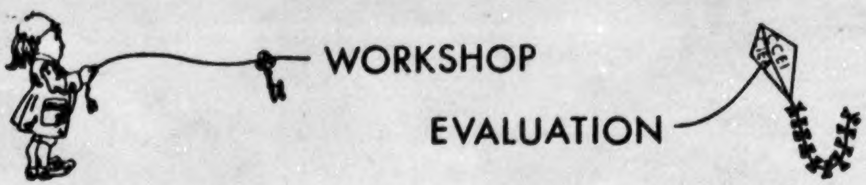
EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in San Jose	Please) 6/2/9	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Grea Stuf
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Definitely - long overdue					

Remarks:

THANK YOU!



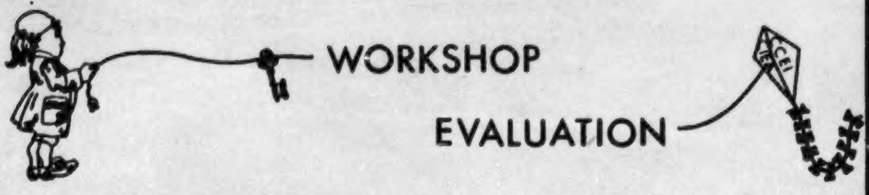
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?						
4. How helpful do you think these curriculum materials will be to you?						
5. Were the physical arrangements adequate for the workshop?						
6. Was the media appropriate? (If used)						
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: MORE THE BETTER !					

Remarks: UNITS ON MATH FOR ELECTRONICS ?
PC PATTERN DESIGN ?
IRST REAL HELP FOR CLASSROOM ISTRUCTOR TO
COME FROM STATE EFFORT.

THANK YOU!



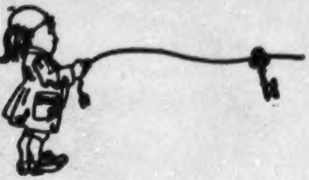
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in North [illegible]	Please) 2/6	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?					✓	
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)		✓				
7. Was enough time allowed for you to review, evaluate, and receive materials?		✓				
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes					

Remarks: Calif. is on the right track
in making this material for teachers

THANK YOU!



WORKSHOP EVALUATION

CATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

ornia State Department of Education icity/Electronics Curriculum Project rvice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
ere the Inservice Workshop objectives attained?						✓
Did you receive curriculum aterials, and was the uality satisfactory?						✓
low well was the presentation rganized and delivered?						✓
low helpful do you think hese curriculum materials ill be to you?						✓
ere the physical arrange- ents adequate for the orkshop?						✓
as the media appropriate? If used)						✓
as enough time allowed for ou to review, evaluate, and eceive materials?						✓
hould there be further evelopment of curriculum aterials? (11th & 12th rade etc.)	Comments:					

arks: ____________________

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?				Yes		
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?				Yes		
6. Was the media appropriate? (If used)				Yes		
7. Was enough time allowed for you to review, evaluate, and receive materials?				Yes		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes					

Remarks: ____________________

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) SAN JOSE	6-2-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.) 6 12-19	Comments:					

Remarks: ____________________

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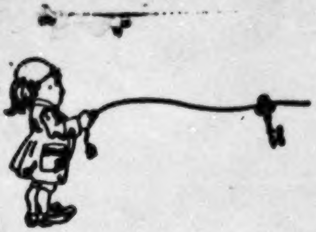
THANK YOU!



WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: Great presentation: Appears that I can use much of the material -

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 5-12	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes, please					

Remarks:

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 12 May 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES - LOOKS LIKE GREAT STUFF.					

Remarks: SINCE TASKS HAVE BEEN IDENTIFIED, INDUSTRY HAS STATED ITS NEEDS, THEN WHY SHOULDN'T INSTRUCTION BE STANDARDIZED. SPECIALTY PROGRAMS SHOULD BE LIMITED TO LOCAL NEEDS AND BE IN ADDITION TO THE STANDARD CURRICULUM.

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in [illegible] ROC Stockton	Please) 5-11-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?				✓		
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?				✓		
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: [illegible] [illegible] - WE NEED HIGHER LEVEL MATERIAL && 13-14 GRADE IS ALSO DESPERATELY NEEDED!					

Remarks: THESE PRESENTERS ARE VERY DEDICATED & HAVE SHOWN GREAT SKILL, ORGANIZATION & ABILITY TO SYNTHESIZE AN AWFUL LOT OF MATERIAL.

THANK YOU!

WORKSHOP

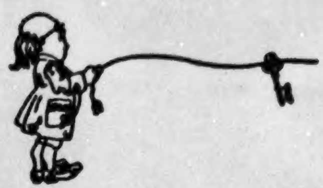
EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Woodruff R.O.C. Stockton	Please) 5/12/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)				✓		
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes, especially at the level we would offer in a Center like Woodruff					

Remarks: ____________________

THANK YOU!



WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 12 May 1979	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Grea Stuf
1. Were the Inservice Workshop objectives attained?					Yes →	X
2. Did you receive curriculum materials, and was the quality satisfactory?					Yes →	X
3. How well was the presentation organized and delivered?					Good!	
4. How helpful do you think these curriculum materials will be to you?					very →	
5. Were the physical arrangements adequate for the workshop?		Very Comfortable (Temperature) —	Seat was difficult	Fans — to lean in	Back	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					Yes →	X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: ____________________

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) May 12	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project Inservice Workshop	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?				4		
2. Did you receive curriculum materials, and was the quality satisfactory?			3			
3. How well was the presentation organized and delivered?		2				
4. How helpful do you think these curriculum materials will be to you?					5	
5. Were the physical arrangements adequate for the workshop?		2				
6. Was the media appropriate? (If used)					5	
7. Was enough time allowed for you to review, evaluate, and receive materials?			3			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Definitely!!					

Remarks: ______

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) May 12	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	
Electricity/Electronics Curriculum Project Inservice Workshop	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Gr St
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?					✓	
6. Was the media appropriate? (If used)					✓	
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: I hope you will do further devel					

Remarks: Many good ideas were presented.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 12 MAY 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?					X	
. How helpful do you think these curriculum materials will be to you?						X
. Were the physical arrangements adequate for the workshop?						X
. Was the media appropriate? (If used) NA						
. Was enough time allowed for you to review, evaluate, and receive materials?						X
. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: KEEP GOING! I NEED 11 & 12 GRADE MATERIAL					

Remarks: This is great! Get some money and print this thing. What good is it if you don't print and send it out?

THANK YOU!

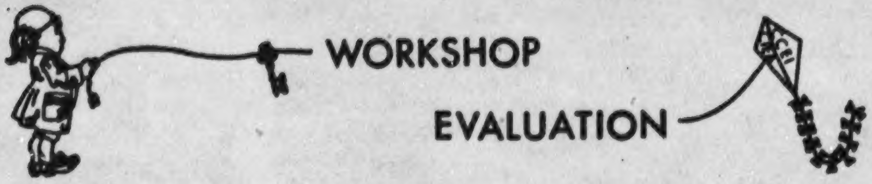
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) MAY 12	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: → Yes					

Remarks:

THANK YOU!



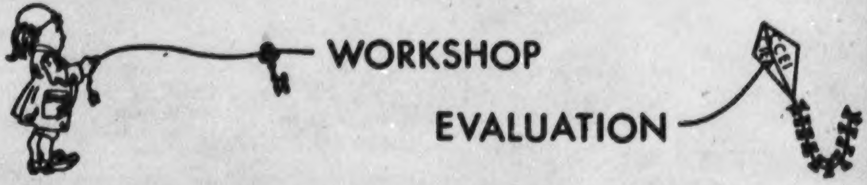
WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?						✓
Did you receive curriculum materials, and was the quality satisfactory?					✓	
How well was the presentation organized and delivered?					✓	
How helpful do you think these curriculum materials will be to you?					✓	
Were the physical arrangements adequate for the workshop?						✓
Was the media appropriate? (If used)				✓		
Was enough time allowed for you to review, evaluate, and receive materials?					✓	
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes & continue					

Remarks:

THANK YOU!



WORKSHOP EVALUATION

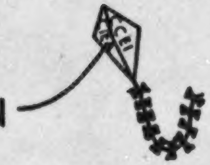
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in WROC STOCKTON	Please) 5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?					☒	
3. How well was the presentation organized and delivered?			☒			
4. How helpful do you think these curriculum materials will be to you?			GOOD	QUESTION		
5. Were the physical arrangements adequate for the workshop?						☒
6. Was the media appropriate? (If used)						☒
7. Was enough time allowed for you to review, evaluate, and receive materials?	☒					
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: WE HAVE 9TH THROUGH 12TH GRADERS IN ELECT. NOT SORTED BY GRADE SO WHY OR HOW CAN WE USE GRADE LEVEL MATERIAL					

Remarks: IN OUR DIST. NO 7 & 8TH GRADE ELECT.

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Woodroff Stockton	Please) 12 May	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
Were the Inservice Workshop objectives attained?			✓			
Did you receive curriculum materials, and was the quality satisfactory?				✓		
How well was the presentation organized and delivered?						✓
How helpful do you think these curriculum materials will be to you?					✓	
Were the physical arrangements adequate for the workshop?			✓			
Was the media appropriate? (If used)						
Was enough time allowed for you to review, evaluate, and receive materials?						
Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Finish Project					

Remarks:

THANK YOU!

WORKSHOP EVALUATION

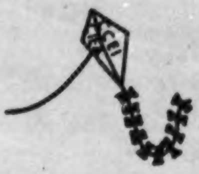
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in WOODRUFF R.O.C. STOCKTON	Please) 12 MY 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: THIS IS MOST VITAL. MATERIAL THIS WELL PREPARED WILL BE USED. THE TAXPAYER WILL GET HIS MONEYS WORTH WITH THIS.					

Remarks: THANK YOU ALL! This is without a doubt the most useful State sponsored project in existence. Your efforts have been SUPER!

THANK YOU!

WORKSHOP EVALUATION



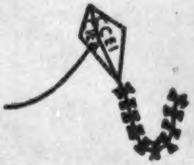
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						Y
2. Did you receive curriculum materials, and was the quality satisfactory?						Y
3. How well was the presentation organized and delivered?						Y
4. How helpful do you think these curriculum materials will be to you?						Y
5. Were the physical arrangements adequate for the workshop?						Y
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						Y
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES!					

Remarks: Sounds very good! Need time study.

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) May 12, '79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: by all means!					

Remarks:

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STockTon	Please) 5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project nservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
. Were the Inservice Workshop objectives attained?					✓	
. Did you receive curriculum materials, and was the quality satisfactory?						✓
. How well was the presentation organized and delivered?						✓
. How helpful do you think these curriculum materials will be to you?						✓
. Were the physical arrangements adequate for the workshop?						✓
. Was the media appropriate? (If used)						✓
. Was enough time allowed for you to review, evaluate, and receive materials?						✓
. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Maybe. Not enough students to support the program?					

emarks: Thank you, I needed this.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	✓
2. Did you receive curriculum materials, and was the quality satisfactory?						
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Yes - Level III & IV would be an excellent compliment to these materials					

Remarks: Excellent helps to the teacher who desires to fill in his curriculum but has little time to develope them. Excellent workshop.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Ilum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?						X
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?						X
6. Was the media appropriate? (If used)						X
7. Was enough time allowed for you to review, evaluate, and receive materials?						X
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments:					

Remarks: Unit #4 GO ASAP.
I don't understand why the State would hesitate to Print this material. Don't they realize what they have here? If ~~I~~ they dont, then why are they in the State Dept. of Ed?

THANK YOU!

WORKSHOP EVALUATION

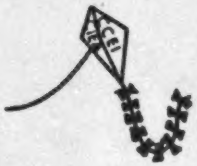
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 5/12/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Ilum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?			✓			
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES, ABSOLUTELY					

Remarks: From what I have seen of this material, I am very pleased to receive this. Can really use this, now!!

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?			~~✓~~			✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: definitely					

Remarks: Please complete grade 11-14 material
It's about time the State supported something
worthwhile

THANK YOU!

WORKSHOP EVALUATION

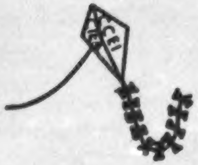
LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) 5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?				✓		
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES SHOULD BE COMPLETED					

Remarks: NEED TO COMPLETE LEVEL IV MATERIALS
AS SOON AS POSSIBLE

THANK YOU!

WORKSHOP EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 12 MAY	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?				✓		
2. Did you receive curriculum materials, and was the quality satisfactory?					✓	
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?						✓
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES!! Especially when you draw info from "SILICON GULCH"					

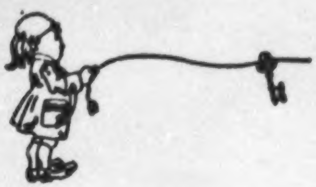
Remarks: ______________________

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in	Please)	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

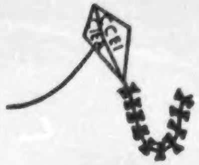
California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?			✓			
2. Did you receive curriculum materials, and was the quality satisfactory?			✓			
3. How well was the presentation organized and delivered?			✓			
4. How helpful do you think these curriculum materials will be to you?				✓		
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: yes but we should start stressing practical electronics not fun electronics as it was presented in this workshop.					

Remarks: ______________________



WORKSHOP

EVALUATION



LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 5/12/79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

alifornia State Department of Education lectricity/Electronics Curriculum Project Inservice Workshop	1 No Ilum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?			✓			
. How helpful do you think these curriculum materials will be to you?					✓	
. Were the physical arrangements adequate for the workshop?						✓
. Was the media appropriate? (If used)						✓
. Was enough time allowed for you to review, evaluate, and receive materials?		✓				
. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: GREATEST NEED					

emarks: ______________________

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 12 MAY 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project Inservice Workshop	1 No Ilum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Wow, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					X	
2. Did you receive curriculum materials, and was the quality satisfactory?					X	
3. How well was the presentation organized and delivered?				X		
4. How helpful do you think these curriculum materials will be to you?					X	
5. Were the physical arrangements adequate for the workshop?				X		
6. Was the media appropriate? (If used)				X		
7. Was enough time allowed for you to review, evaluate, and receive materials?			X			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES !!!!					

Remarks: ______________________

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Stockton	Please) May 12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?					✓	
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?						✓
5. Were the physical arrangements adequate for the workshop?			✓			
6. Was the media appropriate? (If used)			✓			
7. Was enough time allowed for you to review, evaluate, and receive materials?			✓			
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES!! I hope it will be completed thru 12th grade.					

Remarks: You people have done for me many of the things I keep telling myself I should do, but never get around to doing. You have also done it very well. I think the material will really be helpfull.

THANK YOU!

WORKSHOP EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in STOCKTON	Please) 12 MY 79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education Electricity/Electronics Curriculum Project **Inservice Workshop**	1 Ho Hum	2 Eh, So-So	3 Better Than Expected	4 Good Food For Thought	5 Now, I can use this	6 Great Stuff
1. Were the Inservice Workshop objectives attained?						X
2. Did you receive curriculum materials, and was the quality satisfactory?						X
3. How well was the presentation organized and delivered?					X	
4. How helpful do you think these curriculum materials will be to you?						X
5. Were the physical arrangements adequate for the workshop?					X	
6. Was the media appropriate? (If used)					X	
7. Was enough time allowed for you to review, evaluate, and receive materials?					X	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: YES! THE NEED DOES EXIST.					

Remarks: IT IS GREAT TO SEE THIS MATERIAL AVAILABLE. IT HAS BEEN NEEDED FOR A LONG TIME.

THANK YOU!

WORKSHOP

EVALUATION

LOCATION	DATE	TOPIC	PRESENTERS
(Fill in Please) Woodruff ROC	5-12-79	Industrial Education Electricity/Electronics Curriculum Guide Phase II Instructional Modules	Keith Bush Robert Lillo Nick Soffiotto

California State Department of Education	1	2	3	4	5	6
Electricity/Electronics Curriculum Project **Inservice Workshop**	Ho Hum	Eh, So-So	Better Than Expected	Good Food For Thought	Wow, I can use this	Great Stuff
1. Were the Inservice Workshop objectives attained?						✓
2. Did you receive curriculum materials, and was the quality satisfactory?						✓
3. How well was the presentation organized and delivered?						✓
4. How helpful do you think these curriculum materials will be to you?					✓	
5. Were the physical arrangements adequate for the workshop?						✓
6. Was the media appropriate? (If used)						✓
7. Was enough time allowed for you to review, evaluate, and receive materials?					✓	
8. Should there be further development of curriculum materials? (11th & 12th grade etc.)	Comments: Definately					

Remarks: ____________________

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THANK YOU!